International Journal of American Linguistics

VOLUME XIX April, 1953 NUMBER 2

A COMPARISON OF TWO MIXTEC TONEMIC SYSTEMS

CORNELIA MAK

SUMMER INSTITUTE OF LINGUISTICS

0. Introduction
1. General tonemic and morphotonemic structure of morphemes
2. Progressive perturbation in regular sequence types
3. Progressive perturbation in special sequence types
4. Progressive perturbation of and by pronoun enclitics
5. Regressive perturbation
6. Sub-phonemic tone modifications
7. Summary

0. The tonemic-morphotonemic system of the dialect of Mixtec spoken in the town of San Miguel el Grande, Tlaxiaco district, Oaxaca, Mexico, where K. L. Pike and his colleagues pioneered for a number of years, has been described in some detail.[1] While variations have been evident in the neighboring dialects, no systematic study has been made of any one of them, and therefore comparative phonemic and tonemic studies have not been possible.

The town of San Esteban Atatláhuca is only two hours by foot west of San Miguel el Grande, yet the dialect spoken there necessitates a considerable modification of the tonemic descriptions given for San Miguel.[2]

[1] See Kenneth L. Pike, Analysis of a Mixteco Text, IJAL 10: 113-38 (1944); and idem., Tone Languages, University of Michigan Publications, Linguistics IV (Ann Arbor, 1948), 77–94. In addition to Pike's work on Mixtec, there is the attractive ethnologic-linguistic volume by Leonard Schultze-Jena, Bei den Azteken, Mixteken und Tlapaneken der Sierra Madre del Sur von México, Indiana Vol. III (Publicado bajo los auspicios de la sociedad México-Alemana Alejandro de Humboldt, 1938), describing the Mixtec of the State of Guerrero, particularly the town of Cahuatachi; and a very old grammar attempting to fit Mixtec into the Latin mold: Fray Antonio de los Reyes, Arte en Lengua Mixteca, published in 1593, based on the environs of Tepozcolula. The present paper was prepared under the auspices of the Summer Institute of Linguistics during field trips to San Esteban Atatláhuca during parts of the years 1949 and 1950. The bulk of the data was secured in the Rancho of San Pedro Progreso, about an hour from the center of town. I am greatly indebted to K. L. Pike, both for his extensive editing of the paper and for his aid in the interpretation of some of the data, particularly in the matter of 2-^{1} glides on morpheme-initial syllables, which I had earlier heard as level tones and had postulated as a fifth toneme; and also to William L. Wonderly, who spent considerable time editing and clarifying the paper. Names of the two towns are abbreviated in this paper as follows: San Esteban Atatláhuca, SE; San Miguel el Grande, SM.

[2] The phonemes of these two Mixtec dialects are as follows: voiceless unaspirated stops /p, t, č, k, k^{w}, ʔ/ (/k/ in SE at times very lenis, especially before /u/; /ʔ/ usually very lenis in both dialects); prenasalized voiced stops /^{m}b, ^{n}d, ^{n}j, ^{ŋ}g/; fricatives /b, d, ž, h/ (/b/ very lightly occlusive except after glottal stop or between /ə/ vowels when it becomes [w], but in some dialects in SE the friction is heard in all environments; /ž/ alternating non-phonemically with [y], especially in enclitic position; /h/ varying freely with frictionless velar); sibilants /s, š/ (/š/ in SM retroflexed in certain morphemes with some speakers); nasals /m, n, N, ñ (/N/ has allophone [Nn] morpheme initially, elsewhere [hn]; /N/ is a unit phoneme, occurring in SE only); liquids /l, r/ (/r/ being a flap in the only two enclitics in which it occurs); oral vowels /i, e, a, o, u, ə/ (/i, a, o, u/ approximately as in Spanish mil, mal, mole, mula; /e/ as in Spanish leña, with more open allophone in morphemes with medial glottal stop, medial prenasalized voiced stop, or medial /t/ or /r/; /ə/ high, back, unrounded, often approaching more fronted position following alveolar consonants, especially in SM); nasalized vowels /į, ę, ą, ǫ, ų, ę/ (/ę/ appears only in SE); semivowel /y/ (rare, as second member of a consonant cluster); tonemes as described in **1.2**.

Since the tonal system of SM has been described by Pike, we present the SE system throughout this paper in comparison with that of SM. The chief differences concern tonemes (four level tonemes and some single-syllable tone sequences in SE, three level tonemes and no single-syllable tone sequences in SM); perturbing action[3] (from higher to lower: extensively in SE, seldom in SM;[4] from lower to higher: limited to certain classes of morphemes and certain syntactic positions in SE, extensive and almost entirely unrestricted by syntactic position in SM); direction of perturbation (both progressive and regressive in SE; only progressive, with one minor exception to be described later, in SM).

1. General tonemic and morphotonemic structure of morphemes.

1.1. For both SE and SM, the basis of all tonemic analysis is the dissyllabic morpheme, with its minimum of two level tonemes (referred to as TONE COUPLETS), one toneme on each syllable. In SE there are, however, a few tone sequences (actualized phonetically as tone glides) on single syllables; these will be described later. Morphemes in both dialects which have two contiguous vowels are dissyllabic, and the phonetic tone glides (phonemically sequences of two tonemes) spread over such two-mora dissyllabic morphemes differ phonetically, chiefly in speed, from certain one-syllable tone glides (also phonemically sequences of two tonemes) to be described later. Items with three syllables consist of two mor-

Forms often differ in the two dialects in one or more of the following ways:

By vowel substitution (SE cited first and then SM): kʷe³ʔe⁴, kʷaʔà *much*; te⁴e²/³, čàa *man*; ke²e³, čaà *come*; ʔi³te³, ʔičà *grass*; biʔ²ⁿde⁴, biʔ²ⁿjà *nopal cactus*; ⁿde¹e¹, ⁿjáá *blue*; he¹te³, háča *dig*; hiʔ¹ni², húʔni *tying*; žo⁴kį¹, žòkǫ́ *hair brush*; le¹ču¹, ločé *milk* (Sp. leche); ña³ə⁴, ñil *salt*; ka³tə⁴-ni³, kitì ʔinì *be angry*.

By consonant substitution: Nə¹ña¹, təñí *mouse*; Nə³ə², tǫǫ *grasp*; tu²Nu², ⁿdukù *firewood*; Ni¹i¹, tíñu *fingernail*; žu²Nu², žunu *tree, wood*; Na³ma², nama *rescue* (but na³ma⁴, namà *soap*); Nų⁴ʔų²/³, tùʔų *word*; mį⁴hį²/³ bìhį *cold*; ku²ko⁴o², huⁿgòo *enter*; že²Nu⁴, hanù *chest, coffin*; že⁴kə¹ ∼ ži⁴kə¹, hìkí *fist*; sto¹o², šⁿdóo *leave behind*; stə¹ʔə², šⁿdóʔə *finish*.

By toneme substitution: ba¹ʔu¹, báʔù *coyote*; ką¹ʔą¹ kąʔą *speaking*; tu²tu², tutù *paper*; ʔi³so², ʔisò *rabbit*; ku¹ni¹, kuní *want*; Nə¹ñə¹, təñí *mouse*; liʔ¹li³, líʔli *rooster*; ri¹ki³, ríki *woodpecker*; ti⁴či¹, tìči *avocado*.

By abbreviation of forms in either dialect: že?¹ži¹, žušéʔé *door*; kʷeʔ²ži⁴, kʷeʔè *ailment*; kon²-so², kuⁿdiso *carry*; ⁿdu²ši⁴, ⁿdubiši *get warm*; ta¹ta¹, táà *father*; ža²bu², žau *maguey*; ka²Nų⁴ʔų¹, kakà tùʔúį *ask*.

By apparent substitution of morphemes: la²ⁿji², rəə *sheep*; loⁿde², lélú *lamb*; le¹lu¹, kačíní *hat*; liⁿji¹, víló *lizard*; ši²Ni⁴, kutù *nose*; sa²Ne⁴, žučąą *tomorrow*; čų⁴ų¹, sáná *turkey hen*; čeⁿgo³, hàko *opossum*; ža⁴ka², kʷažo *rubbish*; kə⁴mə², tiñùų šíní *star*; ⁿdu²hi¹ lu¹li¹, tərəə *chick*; (occasionally resulting in homophones: SE kʷe³ʔe⁴ *many*, SM kʷeʔè *ailment*; SE le¹lu¹ *hat*, SM lélú *lamb*; SE ke²e³ *come*, SM kee *go* [but always followed by kʷąʔą *go*]).

By shift of meaning: SE kʷiʔ²na⁴ *ugly*, SM kʷiʔnà *demon*; SE čų⁴ų¹ *turkey hen*, SM čùų́ *fowl*; cf. also fn. 10 on the morphemes šę²ę⁴, šąą and lo¹-ko¹, lokó.

[3] By the terms perturbing action and perturbation we mean the replacement of one or more tonemes of a morpheme by another toneme or tonemes under the influence of the tonemes of neighboring morphemes. In spite of possible objections to the use of such 'cause and effect' or 'process' terminology, we can hardly avoid its use in this paper without making our statements unwieldy, until further developments are made in allomorphic theory.

[4] The only instances of perturbation to a lower toneme in the SM dialect are the following: In a close-knit verb phrase consisting of one of the forms of the verbs *go* plus a mid-mid (ᵃ) verb, (i.e. a verb which does not cause perturbation of following tonemes), the first toneme of the second verb is lowered. For instance: kįʔį *will go* + ⁿjaka *carry* > kiⁿjàka *will take to*. For a fuller discussion of this see my A Unique Perturbation in Mixteco, IJAL 16: 82–86 (1950). The morpheme ʔinì *in* perturbs one word, beʔe *house*, to a lower tone: ʔinì bèʔe *in the house*. See Tone Languages, 81–2, for Pike's discussion of this phrase. Some morphemes with high-high tone couplets, when following a mid-low morpheme, are usually, though optionally, changed to low-high: ʔità *flower* + kʷą́ą́ *yellow* > ʔità kʷàą́ *yellow flower*. See Tone Languages, 86, on this.

phemes, the first morpheme being abbreviated by the loss of one of its syllables in a close-knit construction: sa^{1}Ni^{2}ñu^{2} *to work* (<sa^{1}ʔa^{2} *do* + Ni^{2}ñu^{2} *work*).

Abbreviated (monosyllabic) morphemes act like full (dissyllabic) morphemes in that, with few exceptions (1) they condition the perturbation of a following morpheme in the same way as their full form does, and (2) the remaining syllable of the abbreviated morpheme is perturbed in the presence of a preceding conditioning morpheme in the same way as it would be were the morpheme in its dissyllabic form. Hence, unless irregularities are described for specific abbreviated (monosyllabic) morphemes, their action is the same as for the full (dissyllabic) morphemes.

1.2. There are four phonemic levels of tone (=tonemes) in the SE dialect. (Certain prominent sub-phonemic additional tone levels are described under **6.**) Throughout this paper, for SE we show the tonemes with superscript numbers 1 to 4 (1 being the highest and 4 the lowest). Tonemes 1, 2 and 4 correspond roughly to the three SM tonemes of high /ˊ/, mid (unmarked), and low /ˋ/. Note that throughout the paper, SE and SM forms are distinguished orthographically by the different systems of tone marking.

To illustrate the four tonemes of SE, we cite morphemes carrying tone couplets 1–2, 1–3, and 1–4, which show tonal contrasts in an analogous environment (the morpheme -de^{2} *he* preceding the three contrasted couplets belongs to a class of morphemes which do not perturb following tones): kʷą^{2}ą^{2} -de^{2} lu^{1}su^{2} *he will buy a pet dog*: kʷą^{2}ą^{2} -de^{2} bi^{1}či^{3} *he will buy a fan*; kʷą^{2}ą^{2} -de^{2} bi^{1}li^{4} *he will buy a plaything*.

1.3. A toneme sequence occurring on a single morpheme is a TONE COUPLET (see **1.1**). If the tonemes of the couplet have not been perturbed in sandhi, the tone couplet is referred to as BASIC; if they have been perturbed, it is referred to as DEVELOPED. Strictly speaking, morphemes with such developed couplets are bi-morphemes or fused morphemes, but in this paper we speak of them simply as morphemes.[5] Morphemes showing identical tone couplets (i.e. tonemically the same) belong to the same TONE CLASS. Tone classes are basic or developed, depending on the character of their tone couplets.

The following BASIC TONE CLASSES occur in the SE dialect: 1–1, 1–2, 1–3, 1–4; 2–1, 2–2, 2–4; 4–1, 4–2, 4–2/3 (the slant line implies optional occurrence of tone 2 or 3 in all environments); Table 1 lists these together with their morphotonemic types (cf **1.5**). Basic 1–3 couplets are often, but not always, heard with a 3-^{2} glide on their final syllable. (One-syllable toneme sequences cited in the text and abstracted from their vocalic elements, are shown with the second toneme raised.) The optional glide occurring on the final syllable of the basic 1–3 couplets will not be mentioned again, since it is morphotonemically nonsignificant, and is optionally present wherever 1–3 is cited.

TABLE 1—Basic SE Tone Classes and their Morphotonemic Types

1–1 (b, c)	1–2 (a, c)	1–3 (a, c)	1–4 (c)
2–1 (b)	2–2 (a, c)	—	2–4 (c)
4–1 (b)	4–2 (c)	4–2/3 (a)	—

In tone sandhi, the following additional DEVELOPED TONE CLASSES occur: 3–1, 3–2 ∼ 3–3, 3–4; 2–^{1}–1, 2–^{1}–2, 2–^{1}–3, 2–^{1}–4; 1–3–^{1}, 1–3–^{2}, 2–^{1}–3–^{1}, 2–^{1}3–^{2}. Alternation symbolized by ∼ is optional in contexts where these developed tone classes may occur.

[5] For the purposes of this paper, each of the aspects of a verb stem are considered tonally to be independently basic, since the differences between them are not caused by any immediately apparent morpheme, and morphophonemic statements are simplest from such a starting point. For the possibility that these aspect differences are remains of an older layer of sandhi, however, see Pike's Analysis of a Mixteco Text 123–4, and Tone Languages 82. By basic, therefore, we mean without phonemic substitution as a result of preceding or following morphemes.

Of the sixteen theoretically possible sequences of two tonemes, fourteen occur as single couplets (some as basic, others as developed). Couplets *2–3 and *4–4 do not occur.

1.4. The interaction of tonemes of successive morphemes is sometimes dependent on the syntactic sequence types in which they occur. For purposes of describing this action it is convenient to subsume syntactic sequences of two morphemes under two types: sequences showing regular perturbation patterns, referred to as REGULAR SEQUENCE TYPES, and those showing special perturbation patterns, referred to as SPECIAL SEQUENCE TYPES.

The regular perturbation patterns always appear in certain syntactic sequence types, including subject plus object, subject plus verb, adjective plus noun, adjective plus adjective, verb plus verbal close modifier, and certain other loose-knit constructions. See **2** for perturbations within regular sequence types.

The special perturbation patterns appear instead of the regular patterns in certain sequences of grammatically close-knit phrases, including (1) a head noun plus another noun acting as a descriptive modifier, or plus a non-enclitic possessor, or optionally and very rarely, plus an adjective; (2) a locational or introductory noun plus a dependent clause; (3) a head verb plus a noun modifier; (4) certain verb auxiliaries plus a main verb. The appearance of special patterns is optional in certain specific morpheme sequences, obligatory in others. See **3** for perturbations within special sequence types.

1.5. As indicated in **1.3**, SE morphemes are divided into TONE CLASSES in accordance with their tone couplets. By different criteria they may be further divided into three morphotonemic TYPES, according to their influence on the tonemes of following morphemes in regular syntactic sequence types. In regular sequence types, type (^{a}) morphemes are those which do not affect the tonemes of the immediately following morpheme, except for a very limited group of tone classes (i.e. are in general NON-PERTURBING); type (^{b}) morphemes are those which perturb the first syllable of immediately following morphemes of certain tone classes to **higher**; and type (^{c}) morphemes are those which perturb the first syllable of immediately following morphemes of certain tone classes to **lower**.

In the special sequence types noted in **1.4**, many morphemes of types (^{a}) and (^{c}) show a special set of perturbation patterns in which they cause certain following morphemes to be perturbed to higher, but to a set of high patterns different from those developed by perturbation due to (^{b}) morphemes, which also cause perturbation to higher. Such perturbing (^{a}) or (^{c}) morphemes in special sequences will be referred to as type (^{as}) or (^{cs}) couplets; see **3.**

Couplets of tone classes 4–1 or 3–1 (basic or developed) may be perturbed regressively by a following toneme 1 to 4–2 and 3–2 respectively; couplets of tone classes 1–2 or 2–^{1}–2 (basic or developed) may be perturbed regressively by a following toneme 1 to 1–1 and 2–^{1}–1 respectively; see **5.**

1.6. To demonstrate the various types of tonal sandhi in groups of two morphemes, we first give a few selected examples from SE; detailed descriptions will be given later.

ʔə^{2}ʔə^{2} ^{n}də^{2}bə^{4} *one egg.* ʔə^{2}ʔə^{2} *one* is a type (^{a}) non-perturbing morpheme, which in regular sequence types does not perturb the tones of ^{n}də^{2}bə^{4}. This particular morpheme never occurs as the first member of a special syntactic sequence, and thus never perturbs the tones of morphemes following it. See **2.1** for detailed description of the action of type (^{a}) morphemes.

ta^{4}ka^{2} ^{n}də^{1}bə^{4} *each egg;* ta^{4}ka^{2} hi^{1}ka$^{3\text{-}2}$ *each basket.* ta^{4}ka^{1} *each* is a type (^{b}) morpheme, so it perturbs the first syllable of certain following tone classes to higher. Note than ^{n}də^{2}bə^{4} *egg* and hi^{4}ka^{2} *basket* belong to different basic tone classes and are perturbed differently following ta^{4}ka^{1}. On the other

hand, although ta⁴ka¹ *each* is a type (ᵇ) morpheme, it is itself perturbed regressively to ta⁴ka² by the following toneme 1, in a reciprocal tone action. See **2.2** for detailed description of perturbations caused by morphotonemic type (ᵇ) morphemes, and **5** for detailed description of regressive perturbations.

ʔə²ⁿga² ⁿdə³bə⁴ *another egg*; ʔə²ⁿga² hi⁴ka² *another basket*. ʔə²ⁿga² *another* is a type (ᶜ) morpheme, so in regular sequence types it perturbs certain following tone classes, of which ⁿdə²bə⁴ *egg* is a sample, to lower. Note that hi⁴ka² *basket* is a member of a tone class not perturbed in this way, because it has an initial toneme 4, which is already low and cannot be perturbed lower. ʔə²ⁿga² never occurs as the first member of a special syntactic sequence, and thus never perturbs following tonemes to higher. See **2.3** for detailed description of perturbations caused by morphotonemic type (ᶜ) morphemes.

žu²ku² ⁿdə¹ə¹ *egg mountain* (i.e. *the place where eggs are to be had*); žu²ku² la²⁻¹ⁿǰi² *sheep mountain* (i.e. *the place where sheep graze*; these forms appear in expressions such as *I am going to go buy some eggs*, or *I am going to the mountain with my sheep*, a common figure of speech in this dialect). žu²ku² *mountain* is a type (ᵃ) non-perturbing morpheme in regular syntactic sequence types, but in the above special syntactic sequence it operates as (ᵃˢ), and causes one or both of the tonemes of certain following morphemes to be perturbed to higher; see **3**. The morpheme ⁿdə²bə⁴ *egg* following it is perturbed to 1–1, but the morpheme la²ⁿǰi² *sheep*, of a different basic tone class, is perturbed to 2–¹–2. Following the (ᵇ) morpheme ta⁴ka¹ *each*, above, ⁿdə²bə⁴ *egg* was given a raised perturbation from 2–4 to 1–4; following the (ᵃˢ) morpheme žu²ku² *mountain* in this special syntactic sequence, it was also raised, but to a different pattern, i.e. 1–1.

nu²u⁴ ⁿdə³bə¹ ∼ ⁿdə²bə¹ *to the eggs* (e.g. in such phrases as *add some chile to the eggs*); nu²u⁴ žu²⁻¹ku² *to the mountain*. nu²u⁴ *to* is a type (ᶜ) morpheme, but appears as a (ᶜˢ) in the above special sequence type, where it occurs very commonly. It then causes certain following morpheme tone classes to be perturbed to higher. Thus the morpheme ⁿdə²bə⁴ *egg* following it has its tones perturbed to 3–1 ∼ 2–1, with a toneme higher than its basic 2–4 couplet, but in a pattern different from the two raised patterns cited above. The morpheme žu²ku² *mountain* following nu²u⁴ *to* in this special syntactic sequence is perturbed to 2–¹–2.

The 2–4 tone class, represented by the morpheme ⁿdə²bə⁴ *egg*, may be perturbed in as many as four different ways by immediately preceding morphemes, as we have just seen; this is the only tone class which has so many perturbation possibilities.

From the above illustrations we see that the perturbation of a SE morpheme is dependent (1) on the morphotonemic type and basic tone class of the morpheme preceding or following it, (2) on the basic tone class of the morpheme itself, and (3) on its particular syntactic position.

In SM, on the other hand, certain morpheme tone classes are almost always perturbed to a higher toneme,[6] and always to the same higher tone pattern, regardless of the pattern of the perturbing morpheme preceding them, and regardless of their syntactic position. Furthermore, all SM morphemes with one or more high tones, except pattern low-high, are stable and remain unperturbed in every environment, whereas in SE no tone couplet is stable.

In SM, of the five corresponding phrases with the morpheme ⁿdəbə̀ *egg* listed above, only in the last two would it be perturbed, and in those two the perturbing morpheme would cause ⁿdəbə̀ to be perturbed in the one way only. The SM morphemes žuku *mountain* and nuù *to* are always (ᵇ) morphemes, and do not show special perturbation patterns as in SE; they always perturb certain following morphemes to higher,

[6] See fn. 4.

regardless of their syntactic position: ʔǫ̀ǫ̀ ⁿdəbə̀ *one egg* (ʔǫ̀ǫ̀ is a type (ᵃ) morpheme); tàká ⁿdəbə̀ *each egg* (tàká is a type (ᵃ) morpheme); ʔəⁿgà ⁿdəbə̀ *another egg* (ʔəⁿgà is a type (ᵃ) morpheme); žuku ⁿdəbé *egg mountain* (this phrase, however, is not used as a common figure of speech as in SE) (žuku is a type (ᵇ) morpheme); nuù ⁿdəbé *to the eggs* (nuù is a type (ᵇ) morpheme). Note that SM ⁿdəbə̀ is perturbed to mid-high following both of these type (ᵇ) morphemes, whereas in SE 2–4 couplets are perturbed to 1–4 following type (ᵇ) morphemes, to 1–1 following 2–2 type (ᵃᵃ) and (ᶜᵃ) morphemes, and to 3–1 ∼ 2–1 following 2–4 type (ᶜᵃ) morphemes.

2. Progressive perturbation in phrases showing regular perturbation patterns.

In order for the reader to understand the general character of the tonemic system of SE, and to have a preliminary idea of its intricate detail, the general classes of perturbation have been illustrated above. We turn now to a more detailed description of the tonemic and morphotonemic classes of that system.

SE morphemes of type (ᵃ), (ᵇ) and (ᶜ) may precede morphemes of ANY BASIC TONE CLASS (see Table 1). The basic tonemes of the second morpheme in regular sequences remain unchanged or undergo certain perturbations, depending on the type of the preceding morpheme. (Perturbations in certain special syntactic sequences are discussed under **3.**)

2.1. SE type (ᵃ) morphemes include certain morphemes of basic tone classes 1–2, 1–3, 2–2, and all morphemes of class 4–2/3; cf. Table 1. Note that these tone couplets are those with final toneme 2 or 3 (except couplet 4–2). One group of tone couplets is designated as 4-2/3, since for these, their final tone fluctuates freely between 2 and 3 in all environments. The 4–2/3 couplets are all (ᵃ) morphemes, whereas 4–2 couplets are all (ᶜ) morphemes; see Table 4. The (ᶜ) couplets are 4–2 and not 4–2/3 because their final tone is always higher than a following developed toneme 3 (from basic tonemes 1 or 2).

SM type (ᵃ) morphemes include forms with all tone couplets.[7]

The basic tonemes of morphemes that follow SE type (ᵃ) morphemes remain unchanged except for the optional lowering of toneme 2 to toneme 3 in 2–1 and 2–2 couplets, after an (ᵃ) morpheme with a final toneme 3 (i.e. 1–3 (ᵃ) and the 4–3 form of 4–2/3 (ᵃ) couplets). We have, for instance, the following variations of tone in a phrase with the 4–2/3 (ᵃ) morpheme te⁴e² ∼ te⁴e³ *man* plus the 2–2 morpheme ⁿdu²te² *water*: ko²ʔo² te⁴e² ⁿdu²te² ∼ ko²ʔo² te⁴e³ ⁿdu²te² ∼ ko²ʔo² te⁴e³ ⁿdu³te³ *the man will drink water*. After the 1-3 (ᵃ) morpheme če¹ⁿgo³ *opossum*, the morpheme ʔi²na² *dog* may or may not be lowered to 3–3: žu¹ʔu¹ če¹ⁿgo³ ʔi²na² ∼ žu¹ʔu¹ če¹ⁿgo³ ʔi³na³ *the opossum is afraid of the dog*.

TABLE 2—Perturbation of couplets following (ᵃ) couplets in SE

After basic:	Basic:	Appears as:
1-3 (ᵃ) 4-3 (ᵃ)	2-1 2-2	2-1 ∼ 3-1 2-2 ∼ 3-3

All other tone classes appearing after type (ᵃ) couplets in regular sequences remain unchanged. See text for explanation of variants.

Table 2 shows the effect that SE type (ᵃ) morphemes with final toneme 3 have

[7] However, type (ᵃ) morphemes in the high-high class in SM are rare. Exceptions are: ñáá *bad*; sə́ʔə́ *female*; žíí *male*; ⁿdáʔú *poor*; šⁿdáʔú *deceive* [lit. *cause to be poor*]; lúlí *small*; žúʔú *to fear*; šą́ą́ *very much so in a good sense*; náá *I*, polite; níí *you*, polite; róó *you*, familiar; žóó *we*, inclusive; none of which have perturbing influence though they are high-high morphemes. Of the short enclitic forms of these pronouns, −ná, −ní, −ró and −žó, the first two are (ᵃ) morphemes and do not cause perturbation, and the second two are (ᵇ) morphemes and do cause perturbation of a following morpheme. Most of the remainder of the morphemes in the above list are adjectives derived from non-perturbing nouns in other tone classes.

upon those immediately following couplets which are subject to their perturbing influence. The tone couplets shown in the third column are the tone patterns taken by the second of a sequence of two morphemes, the first morpheme of the sequence being a type (ᵃ) morpheme carrying either of the tone couplets listed in the first column of the table. (See **3** for perturbing action of type (ᵃ) morphemes in special syntactic sequence types.)

2.2. SE type (ᵇ) morphemes include certain morphemes of basic tone classes 1–1, and all morphemes of tone classes 2–1 and 4–1; cf. Table 1. Note that these tone couplets are all the basic ones with final toneme 1.

SM type (ᵇ) morphemes include forms with all tone couplets except low-mid, mid-high, and high-low.

SE type (ᵇ) morphemes always cause perturbation of certain following morphemes in the same way, regardless of their syntactic position; i.e. their perturbing action is never modified in special syntactic sequences. Type (ᵇ) morphemes perturb all those couplets immediately following them which have a toneme 4, by a raising of their initial toneme to 1 (unless already 1) and a lowering of their final toneme to 3 (unless already 3 or 4), with or without a monosyllabic glide back to the final toneme of the basic couplet. (Such tone glides on single syllables are never found in SM.) For example, we have the following contrast after the morpheme -ni^{1} (ᵇ) *you* > -ni$^{3\text{-}2}$ (ᵇ) after hi^{1}ni^{1} (ᶜ) *know*: hi^{1}ni^{1}-ni$^{3\text{-}2}$ są^{1}ʔą^{4} (<są^{2}ʔą^{4} *genteel words*) *you know the genteel words*; but hi^{1}ni^{1}-ni$^{3\text{-}2}$ są^{1}ʔą$^{3\text{-}1}$ (<są^{4}ʔą^{1} *me*) *you know me*. However, in SE a developed 1–3–^{1} or 1–3–^{2} couplet often alternates with 1–3 in fast speech, the glide being lost, especially on a morpheme with intervocalic consonant other than glottal stop.

Table 3 shows the basic tone classes of SE type (ᵇ) morphemes and the effect they have upon those immediately following couplets which are subject to their perturbing influence in any syntactic environment.

2.3. SE type (ᶜ) morphemes include all morphemes of basic tone classes 1–4, 2–4, and 4–2, and certain morphemes of basic tone classes 1–1, 1–2, 1–3, and 2–2; cf. Table 1. The (ᶜ) group comprises the largest number of morphemes in the dialect, and has the most far-reaching perturbing effect on following morphemes.

In SM such (ᶜ) action is extremely limited.[8]

As regards the correlation of SE morpheme types (ᵃ, ᵇ, ᶜ) with the basic tone classes, note in Table 1 that morphemes of both types (ᵃ) and (ᶜ) appear in tone classes 1–2, 1–3 and 2–2. Morphemes of both types (ᵇ) and (ᶜ) appear in tone class 1–1. No tone class is represented by both types (ᵃ) and (ᵇ) morphemes. Appearing exclusively with type (ᵃ) are 4–2/3 morphemes. Appearing exclusively with type (ᵇ) are 2–1 and 4–1 morphemes.

TABLE 3—Perturbation of couplets following (ᵇ) couplets in SE

After basic:	Basic:	Appears as:
1–1 (ᵇ)	2–4	1–4
2–1 (ᵇ)	4–1	1–3–^{1} ∼ 1–3
4–1 (ᵇ)	4–2	1–3–^{2} ∼ 1–3
	4–2/3	1–3–^{2} ∼ 1–3

Other tone classes appearing after type (ᵇ) couplets remain unchanged. See text for explanation of variants.

In the 1–1 (ᶜ) group are found certain verbs in the continuative aspect,[9] almost all of which are 2–4 (ᶜ) in their potential aspect. The 1–2 (ᶜ) group consists exclusively of verbs in the continuative aspect, which are 2–2 (ᶜ) in their potential aspect. Most Spanish loans in SE are adapted to the 1–1 (ᶜ) pattern. A few which in Spanish are monosyllabic or accented on the last syllable fall into pattern 1–4 (ᶜ). In SM, however, Spanish loans fall into patterns mid-high (ᵃ)

[8] See fn. 4.

[9] See fn. 5.

and high-low (ª). Compare: SE sk^{w}e^{1}la^{1} (ᶜ), SM sk^{w}elá (ª) *school* (Sp. escuela); SE k^{w}e^{1n}du^{1} (ᶜ), SM k^{w}e^{n}dú (ª) *story* (Sp. cuento); SE ho^{1}si^{4} (ᶜ), SM hósò (ª) *sickle* (Sp. hoz); SE re^{1}i^{1} (ᶜ), SM réî (ª) (Sp. rey).[10]

Type (ᶜ) morphemes usually lower the initial basic toneme of a following morpheme in regular sequence types (unless its initial basic toneme is already 4). Basic couplets 1–1, 2–1, 2–2, and 2–4 have their initial tonemes lowered to 3. A developed 3–2 tone couplet (derived by lowering of a basic 2–2 couplet) varies freely to 3–3. Other basic couplets with initial toneme 1 have this toneme replaced by a 2–^{1} monosyllabic glide.

Following 1–4 (ᶜ) and 2–4 (ᶜ) couplets, basic 2–1 and 2–2 couplets often remain unperturbed: sa^{2}Ne^{4} (ᶜ) k^{w}ą^{2}ą^{2} ∼ k^{w}ą^{3}ą^{2} (ª) -na^{1} *tomorrow I will buy (it)*.

In some idiolects, (ᶜ) morphemes of basic tone classes 1–1 and 2–2 (more frequently the latter) vary freely to 1–1–^{4} and 2–2–^{4}, and in this form are occasionally but rarely followed by the unperturbed forms of basic tone patterns 1–2, 1–3, 1–4, 2–1 and 2–2. For instance, when a 1–1 (ᶜ) basic couplet is followed by a 1–2 basic couplet, we may hear the following developed variations in the speech of close neighbors or in the speech of the same individual: 1–1 (ᶜ) + 2–^{1}–2 ∼ 1–1–^{4} (ᶜ) + 2–^{1}–2 ∼ 1–1–^{4} (ᶜ) + 1–2: hi^{1}ni^{1} (ᶜ) bi$^{2\text{-}1}$lu^{2} ∼ hi^{1}ni$^{1\text{-}4}$ (ᶜ) bi$^{2\text{-}1}$lu^{2} ∼ hi^{1}ni$^{1\text{-}4}$ (ᶜ) bi^{1}lu^{2} (extremely rarely) *the cat sees* (lit. *sees cat*). When a 2–2 (ᶜ) couplet is followed by another 2–2 couplet, we may hear the following variations: 2–2 (ᶜ) + 3–2 ∼ 2–2 (ᶜ) + 3–3 ∼ 2–2–^{4} (ᶜ) + 3–2 ∼ 2–2–^{4} (ᶜ) + 3–3 ∼ 2–2–^{4} (ᶜ) + 2–2: ʔi^{1}ne^{2} (ª) ʔi^{2}na^{2} (ᶜ) be^{3}ʔe^{2} ∼ ʔi^{1}ne^{2} (ª) ʔi^{2}na^{2} (ᶜ) be^{3}ʔe^{3} ∼ ʔi^{1}ne^{2} (ª) ʔi^{2}na$^{2\text{-}4}$ (ᶜ) be^{3}ʔe^{2} (rarely) ∼ ʔi^{1}ne^{2} (ª) ʔi^{2}na$^{2\text{-}4}$ (ᶜ) be^{3}ʔe^{3} (rarely) ∼ ʔi^{1}ne^{2} (ª) ʔi^{2}na$^{2\text{-}4}$ (ᶜ) be^{2}ʔe^{2} (rarely) *the dog is in the house* (lit. *is-in dog house*).

From the above we observe that the unperturbed alternants occur only after (ᶜ) morphemes with a final toneme 4, and (rarely) after (ᶜ) morphemes with a downward glide to toneme 4 on their final syllable as just described.[11]

Table 4 shows the basic tone classes of SE type (ᶜ) morphemes, and the effect they have upon those immediately following

[10] One Spanish loan, SE lo^{1}ko^{1}, SM lokó *crazy* (Sp. loco), is especially interesting. In SM this word is confined to its Spanish meaning and is often spoken in jest, much as our English word is used. In SE, however, this loan has taken on a much more extended meaning, being very frequently used as a superlative with the meaning *much, very*. It is paralleled by šąą *much, very* in SM, but in SE this morpheme, šę^{2}ę^{4}, is completely incongruous as a superlative unless used with its primary meaning, *fierce, sharp, angry*, which meaning it also has in SM. Note the following: SE he^{1}tu^{1} lo^{3}ko^{1}, SM hatú šąą *it hurts very much*; SE ba^{4}ʔa^{2} lo^{1}ko^{1} ʔi^{3}o^{3} –tə^{1}, SM bàʔa šąą ʔíó-tə̀ *the animal is a very good one*. In SE one cannot couple the morphemes ba^{4}ʔa^{2} *good* and šę^{2}ę^{4} *fierce* because their meanings are contradictory. In SM, on the other hand, the Spanish loan to^{n}dó *so much* (Sp. tanto) is very common, whereas in SE it is less often used.

[11] This observation leads me to the hypothesis that (ᶜ) morphemes are those which historically perhaps ended on a tone 4, whatever their present form, and that this low toneme now usually transfers itself to the following morpheme. When the (ᶜ) morpheme itself ends with a toneme 4, or actualizes with a syllable final down glide, the following morpheme sometimes remains unperturbed. So after 1–4(ᶜ) and 2–4(ᶜ) morphemes, and after 1–1(ᶜ) and 2–2(ᶜ) morphemes when they are actualized as 1–1–^{4} and 2–2–^{4}, we sometimes observe following couplets in their original unperturbed forms, except for 1–1 and 2–4 couplets, which are always perturbed to lower. In other words, (ᶜ) morphemes give the impression of possessing a strong downward pull on their final syllable, which now usually affects the following morpheme, but sometimes is actualized on the final syllable of the (ᶜ) morphemes themselves.

One feature which may tend to corroborate the above hypothesis is that many morphemes which are 2–2(ᶜ) in SE are mid-low(ª) in SM, and many which are 1–1(ᶜ) in SE are high-low (ª) in SM. Certain verbs which carry the same tones in their potential aspect in both dialects (2–4 in SE, mid-low in SM), in the continuative aspect are 1–1(ᶜ) in SE and high-low(ª) in SM. In SM these morphemes have a final low tone and do not affect following tones, but in SE the corresponding morphemes have a higher final tone and cause the initial syllable tone of a following morpheme to be lowered either to a 2–^{1} glide or to tone 3.

couplets which are subject to their perturbing influence in regular syntactic sequence types. (See **3** for perturbing action of type (ᶜ) morphemes in special syntactic sequence types.)

3. Progressive perturbation in special sequence types.

When (ᵃ) or (ᶜ) morphemes cause perturbation to higher tone patterns in special sequences (see **1.4**), we show after them the formula (ᵃˢ) or (ᶜˢ); (ᵃ) or (ᶜ) indicates the original basic tone class of the morpheme, and the symbol (ˢ) indicates that they have a specialized action in special sequence types. In certain close-knit phrases they cause perturbation of certain following tone couplets to higher tone patterns, different from those already described.

Patterns 1–1, 1–2, 1–3, 1–4, and 2–1 (all those with a toneme 1 except 4–1 couplets) are perturbed in the regular way always, i.e. only after (ᶜ) morphemes, which perturb them to lower tone patterns. The special perturbing action is in effect only preceding the lower basic tone classes (2–2, 2–4, 4–1, 4–2 and 4–2/3 couplets) when it perturbs them to higher.

We will see below that specialized action is unpredictable and inconsistent in some of the special syntactic groupings, and that there are many subgroupings and alternants in the resultant tone patterns. 2–2 (ᵃ) and 2–4 (ᶜ) morphemes cause specialized perturbation more commonly and regularly than morphemes of other tone patterns. The majority of specialized perturbations occur following these two basic patterns. Rarely and optionally, specialized perturbation has been observed following other (ᶜ) and (ᵃ) morphemes, chiefly patterns 1–1 (ᶜ), 1–4 (ᶜ), 2–2 (ᶜ), and 4–2/3 (ᵃ).

Specialized perturbations occur as follows:

Most morphemes of tone class 2–2 are perturbed to 2–¹–2 in a special sequence: ⁿda²ža²⁻¹bu² *branch of maguey* (<ⁿda²ʔa² (ᵃˢ) *hand* + ža²bu² *maguey*).

There is, however, a sub-grouping of basic 2–2 morphemes which are perturbed to 2–¹–4 in contrast to the major group of 2–2 morphemes which are perturbed to 2–¹–2. We have such contrasts as: ma²a⁴ ku²⁻¹u⁴ -de³ *he won't die* (<ma²a⁴ (ᶜˢ) *will not* + ku²u² (ᶜ) *will die* + -de² *he*); but ma²a⁴ ku²⁻¹u² -de² či²lo²³lo⁴ *he won't be a masquerader* (<ma²a⁴ (ᶜˢ) *will not* + ku²u² (ᵃ) *will be* + -de² (ᵃ) *he* + či²lo²³lo⁴ *masquerader*). So ku²u² *will die* and ku²u² *will be* are perturbed to 2–¹–4 and 2–¹–2 respectively. A few other 2–2 (ᶜ) morphemes act like ku²u² (ᶜ) *will die* when perturbed to higher.[12]

TABLE 4—Perturbation of couplets following (ᶜ) couplets in SE

After basic:	Basic:	Appears as:
1–1 (∼ 1–1–⁴)(ᶜ)	1–1	3–1
1–2 (ᶜ)	1–2	2–¹–2 (∼ 1–2)
1–3 (ᶜ)	1–3	2–¹–3 (∼ 1–3)
1–4 (ᶜ)	1–4	2–¹–4 (∼ 1–4)
2–2 (∼ 2–2–⁴)(ᶜ)	2–1	3–1 ∼ 2–1
2–4 (ᶜ)	2–2	3–2 ∼ 3–3 ∼ 2–2
4–2 (ᶜ)	2–4	3–4

Unperturbed forms in parentheses in column 3 are idiolectal forms or infrequent alternants which occur only after rare forms in parentheses in column 1. See text for explanation of variants. Other tone classes appearing after type (ᶜ) couplets remain unchanged in regular sequences.

Morphemes of tone pattern 2–4 are perturbed to 3–1 ∼ 2–1 following specialized morphemes with a final 4 toneme, and to 1–1 following other specialized morphemes: kə²bə⁴ ʔu³ni¹ ∼ ʔu²ni¹ *third day* (<kə²bə⁴ (ᶜˢ) *day* + ʔu²ni⁴ *three*). One 2–4 morpheme has a unique perturbation, becoming 1–4 after derived (ᵃˢ) morphemes: ⁿdu²te² stə¹kə⁴ *the ox's water* (<ⁿdu²te² (ᵃˢ) *water* + stə²kə⁴ *ox*).

Morphemes of tone patterns 4–1, 4–2 and

[12] Other 2–2 morphemes which have been observed to act like ku²u² *will die* when perturbed to higher are: ñu²u² *town*; na²a² *lose*; also na²a² -ni² *forget*; kᵠᵠ² *dig*. These are all (ᶜ) morphemes with the 'downward pull' on their final syllable, and it is possible that they still bear traces of a former 2–4 basic pattern; cf. fn. 11.

4–2/3 (i.e. all those with a basic toneme 4 on their initial syllable) are perturbed as they would be under (b) influence, except that they develop a 2–1 glide rather than simple tone 1 on their initial syllable. The 3–1 or 3–2 sequence on their final syllable may in fast speech be abbreviated simply to toneme 3: nu²u⁴ ši²⁻¹ko³⁻¹ -de² ∼ nu²u⁴ ši²⁻¹ko³ -de² *where he will sell it* (<nu²u⁴ (cs) *where* + ši²⁻¹ko³ -de² *where he will sell it* (<nu²u⁴ (cs) *where* + ši⁴ko¹ (b) *will sell* + -de² *he*).

TABLE 5—Perturbation of couplets in special syntactic sequences in SE

After specialized morphemes:	Basic:	Appears as:
More commonly and regularly following: 2-2 (as) 2-4 (cs)	2–2	2–1–2 or 2–1–4
	2–4	1–1 or 1–4 (unique) or 3–1 ∼ 2–1
Rarely and optionally following certain other (as) or (cs) tone couplets; see text		
	4–1	2–1–3–1 ∼ 2–1–3
	4–2	2–1–3–2 ∼ 2–1–3
	4–2/3	2–1–3–2 ∼ 2–1–3

Alternants separated by 'or' are conditioned by preceding morphemes, or by the sub-groupings, explained in the text. Alternants separated by ∼ vary freely in special sequences.

Perturbations in special syntactic sequences are seen in Table 5. Alternants separated by ∼ vary freely in special sequences, but alternants separated by "or" are conditioned either by the tone class of the preceding specialized morpheme or by the sub-grouping of the morpheme being perturbed, as described above. Description of special sequence types follows the table.

We now examine the special sequence types in which perturbation to higher tone patterns after specialized (as) or (cs) morphemes may occur:

(1) Head noun plus another noun acting as descriptive modifier: hi²ka⁴ be²⁻¹ʔe² *the wall of the house* (<hi²ka⁴ (cs) *side* + be²ʔe² *house*); heʔ²e⁴ biʔ³ⁿde¹ ∼ biʔ²ⁿde¹ *foot of the nopal cactus* (<heʔ²e⁴(cs) *foot* + biʔ²ⁿde⁴ *nopal cactus.*).

When a modifier precedes the head noun (usually a numeral, demonstrative noun or adjective), the sequence does not constitute a special sequence: ʔo²ko⁴ na³ma⁴ *twenty [pieces of] soap* (<ʔo²ko⁴ (c) *twenty* + na²ma⁴ *soap*); but na²ma⁴ ʔo³ko¹ ∼ ʔo²ko¹ *twenty-cent soap* (<na²ma⁴ (cs) *soap* + ʔo²ko¹ *twenty-cent soap* (<na²ma⁴ (cs) *soap* + ʔo²ko⁴ *twenty*).

There are some sequences which show arbitrary choice of regular or special perturbation patterns: kʷeʔ²ži⁴ ši³Ni¹ ∼ ši²Ni¹ *illness of the nose*, i.e. *a cold* (<kʷeʔ²ži⁴ (cs) *illness* + ši²Ni⁴ *nose*); but kʷeʔ²ži⁴ nu³u⁴ *illness of the eyes*, i.e. *even inflammation* (<kʷeʔ²ži⁴ (c) *illness* + nu²u⁴ *eyes*). Here both ši²Ni⁴ and nu²u⁴ are of the same basic tone class and both are in the same syntactic position, but the first is consistently perturbed in this position and the second is not.

(2) Noun plus non-enclitic possessor: When a noun acting as possessor follows another noun, the special perturbation is optional, and so we have alternation between regular and special sequence types: ⁿdə²kə² ʔi²⁻¹su² ∼ ʔi²su² *the deer's horns* (<ⁿdə²kə² (as) or (a) *deer* + ʔi²su² *horns*). After 2–2 (a) and 2–4 (c) noun morphemes, following nouns acting as possessors and carrying basic tone patterns which may be specially perturbed show this special perturbation in perhaps a little more than half the utterances; after other tone couplets this perturbation takes place only occasionally: kə⁴sə²/³ ña²ʔa² -ɥ⁴⁻¹; rarely kə⁴sə²/³ ña²⁻¹ʔa² -ɥ⁴⁻¹ *that woman's cooking pot* (<kə⁴sə²/³ (a) or rarely (as) *cooking pot* + ña²ʔa² (a) *woman* + ɥ⁴⁻¹ *that*).[13]

[13] The full form of the enclitic -ɥ⁴⁻¹ is presumably žu⁴kʷą¹ *that thing*. In its one-mora enclitic form it retains the tone couplet of the full form, 4–1. This enclitic is never perturbed to higher by preceding morphemes, but is, however, perturbed regressively in keeping with other 4–1 morphemes.

(3) Noun plus descriptive adjective: Very rarely an adjective following a noun is optionally specially perturbed: le^{1}lu^{1} ba$^{2\text{-}1}$ʔa$^{3\text{-}2}$ *good hat* (<le^{1}lu^{1} (^{cs}) *hat* + ba^{4}ʔa$^{2/3}$ *good*); but more often le^{1}lu^{1} ba^{4}ʔa$^{2/3}$ without the special perturbation. In a few common phrases with an adjective comprising the second morpheme, perturbation is consistent: ta^{2}či^{4} nį$^{2\text{-}1}$į$^{3\text{-}2}$ *strong wind*, i.e. *storm* (<ta^{2}či^{4} (^{cs}) *wind* + nį^{4}į^{2} *strong*).

(4) Locational or introductory noun plus dependent clause: There is a group of nouns which often act as locationals or introducers of a dependent clause. As the center of a noun construction they are as follows: nu^{2}u^{4} (^{c}) *face, eye*; sə^{2}kə^{4} (^{c}) *spine*; he^{2}ʔe^{4} (^{c}) *foot*; ža^{2}ta^{4} (^{c}) *back*; ʔi^{2}či^{2} (^{a}) *road*; žu^{2}ʔu^{2} (^{a}) *mouth*. As locationals or introducers of a dependent clause where they cause specialized perturbation, they take on specialized meanings as follows: nu^{2}u^{4} *to, at, from, where*; sə^{2}kə^{4} *on top of, against* (*someone*); he^{2}ʔe^{4} *at the foot of, in behalf of*; ža^{2}ta^{4} *in back of*; ʔi^{2}či^{2} *toward, to or from the direction of*; žu^{2}ʔu^{2} *at the mouth of*. One such morpheme is limited to the position of introducer of a dependent clause: he^{2}e^{4} *that, that thing*. A few such locational or introductory morphemes, however, constitute a sub-group which does not cause special perturbation in this position. They are: ʔi^{2}ni^{2} (^{c}) *in*; či^{4}hi$^{2/3}$ (^{a}) *inside of, underneath*; hi^{2}o^{2} (^{a}) *by the side of*; la^{1}do^{1} (^{c}) *one side of* (Sp. lado).

Examples are: ʔi^{2}či^{2} ñu$^{2\text{-}1}$u^{4} *toward town* (<ʔi^{2}či^{2} (^{as}) *toward* + ñu^{2}u^{2} *town*); he^{2}e^{4} ni$^{3\text{-}1}$ hę^{2}ę^{2} -ro^{1} -tə^{1} *that you bought the animal* (<he^{2}e^{4} (^{cs}) *that* + ni^{2}i^{4} *completed action* + hę^{2}ę^{2} *bought* + -ro^{1} *you* + -tə$^{2\text{-}4}$ *animal*).

(5) Head verb plus noun modifier: ka^{2}ta^{2} he^{1}ʔe^{1} *will dance* (<ka^{2}ta^{2} (^{as}) *sing* + he^{2}ʔe^{4} *feet*); he^{2}k^{w}i^{2}ñə^{4} žə^{3}tə^{1} ~ žə^{2}tə^{1} *kneel* (<he^{2}k^{w}i^{2}ñə^{4} (^{cs}) *stand* + žə^{2}tə^{4} *leg below knee*). In this context there are many sequences in which special perturbation does not take place: ku^{2}ni^{2} so^{4}ʔo^{2} *listen, hear* (<ku^{2}ni^{2} (^{a}) *hear* + so^{4}ʔo^{2} *ear*); sk^{w}a^{1}ʔa^{2} ši^{2}ni^{4} *memorize* (<sk^{w}a^{1}ʔa^{2} (^{a}) *study* + ši^{2}ni^{4} *head*).

(6) Certain verb auxiliaries plus main verb: Two morphemes (ma^{2}a^{4} negative, prohibitive; and na^{2} deliberative, imperative) are the only verb auxiliaries which cause perturbation of a following verb. (The remaining verb auxiliary morphemes do not cause special perturbation.) Examples are: ma^{2}a^{4} k^{w}a$^{2\text{-}1}$ʔa$^{3\text{-}2}$ -de^{2} *he won't give* (*it*) (<ma^{2}a^{4} (^{cs}) *won't* + k^{w}a^{4}ʔa$^{2/3}$ (^{a}) *give* + -de^{2} *he*); na^{2} ki$^{2\text{-}1}$hi^{2} -i^{2} *well then, let him come* (<na^{2} (^{as}) deliberative + ki^{2}hi^{2} (^{a}) *come* + -i^{2} third person familiar).

From the above it will be seen that special perturbation is unpredictable and irregular. The SE dialect may be undergoing a modification in certain respects, which may account for this phenomenon.

As has already been observed, in SM perturbation to higher is extensive and perturbation to lower very limited. Perturbation to higher in SM is not irregular nor limited to close-knit phrases, as in SE,[14] and morphemes are almost always[15] perturbed in the same way, irrespective of the tones of the preceding perturbing morpheme.

[14] A few rare exceptions in SM are: The morpheme te *and, then*, is never perturbed by preceding (^{b}) morphemes; the morpheme tuku *again* is perturbed only following high-mid(^{b}), mid-mid(^{b}), and mid-low(^{b}) morphemes; in the sequence šĺ ^{n}dasa *or how?* the second morpheme is optionally perturbed or not perturbed, though the first is a (^{b}) morpheme; in the sequence máá-na *just that much more* the second morpheme is not perturbed, though the first is a (^{b}) morpheme. The latter two instances were pointed out to me by Pike, who suggests that the few irregularities here may be residues of an earlier stage more like SE, but now largely levelled out analogically. Similarly, the SM derived adjective tones of fn. 7 may reflect earlier perturbation in close phrases of noun plus noun modifier. The rare instances of lowering mentioned in fn. 4 are perhaps reflexes of an older stage somewhat like SE type (^{c}); compare also fn. 11.

[15] For irregularities, see fn. 4. In addition a 'calling' or 'addressing' pattern may override all basic tone patterns; see Tone Languages 87.

4. Progressive perturbation of and by pronoun enclitics.

Certain of the pronoun enclitics (monosyllabic) have unique tonal rules, and so we treat the entire group separately from their corresponding full forms, which follow the pattern of full morpheme types (ª), (ᵇ), and (ᶜ) already described (cf. **2**). In isolation, as objects of verbs, and in a few other places, the full forms occur. The enclitic forms occur as subjects of verbs (kį²ʔį⁴ -de³⁻² *he will go*), possessors (be²ʔe² -ri² *my house*), and in locational phrases (nu²u⁴ -ni³⁻¹ *to you*). The enclitics fall into the following classes:

GROUP 1: -na¹ (ᵇ) 1st person polite, sing. or pl.; and -ni¹ (ᵇ) 2nd person polite, sing. or pl. (full forms: sa⁴ña¹ (ᵇ) or są⁴ʔą¹ (ᵇ); and ni¹ʔi¹ (ᵇ)). These act tonally like (ᵇ) morphemes unless they immediately follow another morpheme having the same general type of tonal action as themselves, i.e. type (ᵇ), when they lose their (ᵇ) character and become (ᶜ). The symbol (ᶜ<ᵇ) is used to indicate that the basic (ᵇ) character of the morpheme has been changed to (ᶜ); thus: ko²ʔo² (ª) -na¹ (ᵇ) ta¹Na⁴ *I will drink the medicine* (<ta²Na⁴ *medicine*); but žu¹ʔu¹ (ᵇ) -na¹ (ᶜ<ᵇ) ta³Na⁴ *I fear the medicine.*

After (ᶜ) morphemes these enclitics become 3–1: le¹lu¹ (ᶜ) -ni³⁻¹ (<-ni¹) *your hat.* They are then eligible for regressive perturbation to 3–2 before a following toneme 1 in longer phrases (see **5**). So we have že¹hi² -na³⁻¹ ⁿde²žu² *I am eating cooked food* (<že¹hi² (ᶜ) *eating* + -na¹ > -na³⁻¹ (ᵇ) *I* + ⁿde²žu² *cooked food*); but že¹hi² -na³⁻² čų¹ų³⁻¹ *I am eating turkey* (<že¹hi² (ᶜ) *eating* + -na¹ > -na³⁻¹ > -na³⁻² (ᵇ) *I* + čų⁴ų¹ *turkey*).

In SM these are always (ª) non-perturbing morphemes, and being high, they are never perturbed by preceding or following morphemes.

GROUP 2: -ro¹ (ᵇ) 2nd person familiar sing. or pl.; and -žo¹ (ᵇ) 1st person pl. inclusive (full forms: ro¹ʔo¹ (ᵇ); and žo¹ʔo¹ (ᵇ)). In their basic unperturbed form these act like (ᵇ) morphemes, unless they immediately follow another morpheme having the same action as themselves, i.e. type (ᵇ), when they lose their (ᵇ) character and become (ᶜ), as described for group 1 enclitics above. They are perturbed to toneme 4, however, after all (ᶜ) morphemes. When they are perturbed to toneme 4 they take the character of (ᶜ) morphemes. Thus we have: kʷą²ą² -ro¹ nu¹ni⁴ *you buy the corn* (<kʷą²ą² (ª) *buy* + -ro¹ (ᵇ) *you* + nu²ni⁴ *corn*); but ka²hi² -ro⁴ nu³ni⁴ *you eat the corn* (<ka²hi² (ᶜ) *eat* + -ro¹ > -ro⁴ (ᶜ<ᵇ) *you* + nu²ni⁴ *corn*).

In SM these enclitics are -rò (ᵇ) and -žò (ᵇ) respectively. They are perturbed to high tone by preceding high-mid (ª), mid-mid (ª), low-mid (ª), high-high (ᵇ) and low-high (ᵇ) morphemes; and to mid tone by preceding high-mid (ᵇ) and mid-mid (ᵇ) morphemes.

GROUP 3: -ri² (ᶜ) ~ -ri²⁻⁴ (ᶜ) 1st person familiar sing. or pl.; -tə² (ᶜ) ~ -tə²⁻⁴ (ᶜ) *the animal*; -ža² (ᶜ) ~ -ža²⁻⁴ (ᶜ) *deity or sacred personage* (full forms: ru²ʔu⁴ (ᶜ); kə²tə² (ª); ža²a⁴ (ᶜ)). These morphemes are always (ᶜ) in their perturbing effect. They carry toneme 2 ~ 2–⁴ after (ª) morphemes, toneme 4 after (ᶜ) morphemes, and toneme 1 ~ 1–⁴ after (ᵇ) morphemes: žu¹ʔu¹ -ri¹ -to⁴ *I am afraid of the animal* (<žu¹ʔu¹ (ᵇ) *be afraid* + -ri²⁻⁴ > -ri¹ (ᶜ) *I* + -tə²⁻⁴ *animal*); ma²a⁴ ka²⁻¹hi² -tə⁴ ⁿde³ʔe⁴ *the animal mustn't eat the fruit* (<ma²a⁴(ᵒᵇ) *mustn't* + ka²hi² (ᶜ) *eat* + -tə²⁻⁴ > -tə⁴ (ᶜ) *animal* + ⁿde²ʔe⁴ *fruit*); ʔi¹o¹ be²ʔe² -ža²⁻⁴ *the sacred personage has a house* (<ʔi¹o¹ (ᵇ) *there is* + be²ʔe² (ª) *house* + -ža²⁻⁴ *sacred personage*).

In SM -rì is always (ª); -tà and žà are (ᵇ) when they themselves are unperturbed, but (ª) when they have been perturbed. They are perturbed to high following all (ᵇ) morphemes, following general perturbation rules.

GROUP 4: -de² (ª) 3rd person masculine sing. or pl.; -i² (ª) 3rd person familiar sing. or pl., human or inanimate; -ña² (ª) 3rd person feminine sing. or pl. (full forms: te⁴e²/³ (ª); su⁴či¹ (ᵇ); ña²ʔa² (ª)). These act like 2–2 (ª) morphemes, never causing

perturbation. They are perturbed to tone 3 ~ 3-2 after those morphemes which cause perturbation of 2–2 couplets, in accordance with regular (c) action. Examples are: kᵃ¹ᵃ² -de³ žaᵃ²buᵃ⁴ *he is digging a hole* (<kᵃ¹ᵃ² (c) *is digging* + -de² (a) *he* + žaᵃ²buᵃ⁴ *hole*); be²tu⁴ žə²⁻¹ʔə² -i² *the child is wearing a palm girdle* (<be²tu⁴ (c) *palm girdle* + žə¹ʔə² (a) *is wearing* + -i² 3rd person familiar); kʷi⁴ku² -ña² saʔ²ma² *she will sew the cloth* (<kʷi⁴ku²/³ (a) *will sew* + -ña² (a) *she* + saʔ²ma² *cloth*).

In SM -de and -i are (a) in character; -ña is (b) when it itself is unperturbed but su⁴či² luᵘ¹liᵘ¹ *child* (<su⁴či¹ *child* + luᵘ¹liᵘ¹ *little*).

After a 4–1 morpheme, the couplets 2–4, 4–1, 4–2 and 4–2/3 have their first syllables perturbed to toneme 1 by regular (b) action. This second morpheme then also perturbs the 4–1 morpheme regressively to 4–2. Thus we have a reciprocal action; the morpheme which has its tone perturbed to 1 by the 4–1 (b) couplet then causes a lowering of the 4–1 morpheme to 4–2.[17] Compare: bi⁴ta¹ (b) ⁿdi²ka² *the banana is soft* (<ⁿdi²ka² *banana*); and bi⁴ta² (b) tiᵘ¹či³⁻¹ *the avocado is soft* (<tiᵘ¹či¹ *avocado*).

TABLE 6—Pronoun Enclitics in SE

Group	Basic tone patterns and types after type (a) morphemes	Developed tone patterns and types after type (b) morphemes	Developed tone patterns and types after type (c) morphemes
1	−naᵘ¹ (b) −niᵘ¹ (b)	−naᵘ¹ (c<b) −niᵘ¹ (c<b)	−naᵘ³⁻¹ (b) −niᵘ³⁻¹ (b)
2	−roᵘ¹ (b) −žoᵘ¹ (b)	−roᵘ¹ (c<b) −žoᵘ¹ (c<b)	−roᵘ⁴ (c<b) −žoᵘ⁴ (c<b)
3	−riᵘ² (c) ~ −riᵘ²⁻⁴ (c) −təᵘ² (c) ~ −təᵘ²⁻⁴ (c) −žaᵘ² (c) ~ −žaᵘ²⁻⁴ (c)	−riᵘ¹ (c) ~ −riᵘ¹⁻⁴ (c) −təᵘ¹ (c) ~ −təᵘ¹⁻⁴ (c) −žaᵘ¹ (c) ~ −žaᵘ¹⁻⁴ (c)	−riᵘ⁴ (c) −təᵘ⁴ (c) −žaᵘ⁴ (c)
4	−de² (a) −i² (a) −ña² (a)	−de²(a) −i² (a) −ña² (a)	−de³ (a) ~ −de³⁻² (a) −i³ (a) ~ −i³⁻² (a) −ña³ (a) ~ −ña³⁻² (a)

(a) when it is perturbed.[16] These morphemes are perturbed to high following high-mid (b), mid-mid (b) and mid-low (b) couplets.

Table 6 shows the pronoun enclitics in their basic tone patterns and perturbing types after (a) morphemes, and the tone patterns and perturbing types they develop after (b) and (c) morphemes:

5. Regressive perturbation: tonemes affected before a following toneme 1.

Most morphemes of phonemic pattern 4–1 become 4–2 before a following toneme 1:

However, three of these 4–1 morphemes have been found which seem to differ from the others of their class in that they are only rarely perturbed to lower before a following toneme 1. They are: čaᵘ⁴kaᵘ¹ *fish*; čoᵘ⁴koᵘ¹ *ant*; čųᵘ⁴kųᵘ¹ *fly*. Only these three 4–1 morphemes have been observed to remain

[16] Pike suggests that this may prove to be one of the instances in which SE shows analogical leveling, whereas SM reflects an older difference of pattern within the group.

[17] This 'descriptive order' represents an extremely convenient descriptive device, even though the speaker does not, of course, first pronounce the form in one way and then repeat it in several different tone patterns before finishing the sentence. In order to avoid such statements, process terminology and techniques would have to be eliminated and a rigid allomorphic distributional statement substituted for it, without reference to 'basic' versus 'developed' forms. For problems involved in such a procedure, see fn. 3.

unperturbed before a toneme 1, and sometimes, though rarely, they are also perturbed to lower: čų⁴kų¹ lu¹li¹ *species of small fly*; rarely, čų⁴kų² lu¹li¹.

1–1 morphemes with contiguous vowels or with intervocalic glottal stop, when they are perturbed to 3–1 by (ᶜ) action, also have their final tone lowered before a following toneme 1; 1–1 morphemes with intervocalic consonant other than glottal stop, however, are not so affected. Compare the tones of ma¹a¹ demonstrative in the following: ʔi²na² (ᶜ) ma³a¹ (ᵇ) -de² *his dog* (here ma¹a¹ is perturbed to ma³a¹ by regular (ᶜ) action); and ʔi²na² (ᶜ) ma³a² (ᵇ) te¹e³⁻² (ᵃ) -ų⁴⁻¹ *that man's dog* (here ma¹a¹ is perturbed to ma³a¹ by regular (ᶜ) action, and is then in condition to be further modified to 3–2 by the following developed toneme 1).

In addition to the perturbation to lower, described above, there is also a limited and optional regressive perturbation to higher. This occurs when a 1–2 basic or a 2–¹–2 developed (from 2–2 by (ᶜ) action) couplet with contiguous vowels or intervocalic glottal stop, precedes a toneme 1. These couplets may then, optionally but usually, become 1–1 and 2–¹–1 respectively. The optional perturbation of the final syllable of these couplets to 1 before another toneme 1 is in effect in SM as well as in SE. žə²kə² žu²⁻¹ʔu¹ -žo¹ *chin* [lit. *bone mouth our*] (<žə²kə² (ᵃᵃ) *bone* + žu²ʔu² *mouth* + -žo¹ *we incl.*).

When 1–2 basic and 2–¹–2 developed couplets become 1–1 and 2–¹–1 respectively by regressive perturbation to higher, they are then in condition to have the lowering influence, described above, superimposed upon the raising influence. Thus, for example: sa¹ʔa² *make, do* becomes sa¹ʔa¹ in the following: sa¹ʔa¹ (ᵃ) -na¹ (ᵇ) bi²ko² *I will make a fiesta*. In SE this developed 1–1 form may then be lowered to 3–1 following (ᶜ) morphemes. It is then in condition to have its final tone lowered to 3–2 by regressive action as described above: ma²a⁴ (ᶜ) sa³ʔa² (ᵃ) -na¹ (ᵇ) bi²ko² *I won't make a fiesta*. Therefore we have the following process at work upon the morpheme sa¹ʔa² and others of its class: 1–2 > 1–1 > 3–1 > 3–2.

Sometimes we have what at first appears to be noncontiguous perturbation in a sequence of a 2–4 (ᶜᵉ) morpheme plus the morpheme ni²i⁴ (ᶜ) completed action (in fast speech usually ni²) plus a verb. When ni²i⁴ (ᶜ) is perturbed to a higher tone pattern it changes its character from (ᶜ) to (ᵇ): ni³i¹ (ᵇ).[18] It is then also in condition to have its final developed toneme 1 lowered regressively preceding another toneme 1. So ni²i⁴ (ᶜ) > ni³i¹ (ᵇ) > ni³i² (ᵇ) > ni² (ᵇ) in fast speech. The couplet following it is then perturbed according to type (ᵇ): he²e⁴ ni² ką¹ʔą⁴ -de³ *that he spoke* (<he²e⁴ (ᶜᵉ) *that* + ni²i⁴ (ᶜ) > ni³i¹ (ᵇ) > ni³i² (ᵇ) > ni² (ᵇ) *completed action* + ką²ʔą⁴ (ᵉ) *speak* + -de² *he*); nu²u⁴ ni² ʔi¹o³ ⁿdu²te² *where there was water* (< nu²u⁴ (ᶜᵉ) *where* + ni²i⁴ (ᶜ) > ni³i¹ (ᵇ) > ni³i² (ᵇ) > ni² (ᵇ) *completed action* + ʔi⁴o² (ᵃ) *there is* + ⁿdu²te² *water*).

In SM there are no instances of regressive perturbation to lower, but the limited regressive perturbation to higher is in effect, as described above, for both the SE and SM dialects.

6. Sub-phonemic tone modifications.

In addition to the above described tonal phenomena, there is a marked lowering of tones 1, 3 and 4 in certain contexts, which is non-phonemic and for which the conditioning environments and conditioned changes are now given.

When a morpheme has a 2–¹ tone glide on the first syllable (developed after (ᶜ) or (ᵉ) morphemes), the toneme 1 of the sequence is optionally and non-phonemically slightly lowered. This lowering of the toneme

[18] ni²i⁴ completed action is a SE morpheme unique in several ways. This is the only morpheme known to change its character from (ᶜ) to (ᵇ) when it is perturbed to higher. Also, though it seems to be a 2–4 rather than a 2–2 couplet, being often heard with a downward glide, it always perturbs a following 2–2 couplet to 3–2, whereas following other 2–4(ᶜ) morphemes, 2–2 couplets often remain unperturbed.

1 of the 2–^{1} glide practically always takes place when the perturbing morpheme causing this glide has a 1–1 or 1–4 tone couplet. Elsewhere it varies freely with the non-lowered high tone: lo^{1}ko^{1} hi$^{2-1}$nu^{2} -de^{2} *he is running very much*, i.e. *very fast* (<lo^{1}ko^{1} (c) *very much* + hi^{1}nu^{2} (a) *is running* + -de^{2} *he*); here the 1 toneme on the first syllable of developed hi$^{2-1}$nu^{2} is almost always lowered to [1-], (read the raised hyphen here as 'minus'). ʔə^{2n}ga^{2} hi$^{2-1}$nu^{2} *another time* (<ʔə^{2n}ga^{2} (c) *another* + hi^{1}nu^{2} *time*); here the toneme 1 on the first syllable of developed hi$^{2-1}$nu^{2} is sometimes lowered to [1-], and sometimes is as high as preceding tonemes 1 in the utterance.

In sequences of two morphemes, when the second is a basic 4–1 or a developed 3–1 couplet (especially where the developed couplet contains contiguous vowels or intervocalic glottal stop), the toneme 1 on the final syllable of the second morpheme is almost always non-phonemically lowered: ^{n}da^{ʔ1}žu^{1} su^{4}či^{1} -ɥ$^{4-1}$ *that child is crying* (< ^{n}da^{ʔ1}žu^{1} (c) *is crying* + su^{4}či^{1} *child* + -ɥ$^{4-1}$ *that*); here the toneme 1 on the final syllable of su^{4}či^{1} is usually lowered to [1–]. ^{n}da^{ʔ1}žu^{1} (c) ma^{3}a^{1} -i^{2} *that little one is crying* (<^{n}da^{ʔ1}žu^{1} (c) *is crying* + ma^{1}a^{1} (b) demonstrative + -i^{2} 3rd person familiar); here the toneme 1 on the final syllable of developed ma^{3}a^{1} may be optionally lowered to [1–].

In sequences of three or more morphemes, when the second morpheme has had a toneme 1 lowered to [1–], the third and all following morphemes to the end of the utterance may have their tonemes 1 optionally and non-phonemically lowered to [1–]: a^{1} hi^{1}ni^{1} -ni$^{3-1}$ ^{n}du^{2}či^{2} la^{1}ba^{1} lu^{3}li^{1} *do you know little horse beans?* (<a^{1} (b) *question* + hi^{1}ni^{1} (c) *know* + -ni^{1} (b) *you* + ^{n}du^{2}či^{2} (a) *beans* + la^{1}ba^{1} (c) *horse beans* (Sp. haba) + lu^{1}li^{1} *little*); here the toneme 1 on developed -ni$^{3-1}$ is practically always lowered to [1–] and the tonemes 1 on la^{1}ba^{1} and developed lu^{3}li^{1} are often but not always lowered to [1–].

The pitch interval between phonemic tonemes 1 and 2 is considerably wider than between 2, 3 and 4. This fact, together with the marked nonphonemic lowering of toneme 1 as described above, and the speed of the 2–^{1} developed glides which makes them extremely difficult to hear, has caused considerable analytical difficulty. See now Pike's comments on this particular difficulty.

In sequences of two morphemes, in which the first has a toneme 3 on its final syllable, and the second has a toneme 3 (developed) on its first syllable, the toneme 3 of the first syllable of the second morpheme is always lowered to [3–], but this lowered tone still contrasts with a toneme 4 in the same position: ʔi^{1}o^{1} bi^{1}či^{3} na^{3}na^{1} -ɥ$^{4-1}$ *that lady has a fan* (<ʔi^{1}o^{1} (b) + bi^{1}či^{3} (c) *fan* + na^{1}na^{1} (c) *lady* + ɥ$^{4-1}$ *that*); developed na^{3}na^{1} has its toneme 3 lowered to [3–] following bi^{1}či^{3}. Contrast: ʔi^{1}o^{1} bi^{1}či^{3} te^{4}e$^{2/3}$ -ɥ$^{4-1}$ *that man has a fan* (<te^{4}e$^{2/3}$ *man*); bi^{1}či^{3} does not affect the first toneme of te^{4}e$^{2/3}$, which is lower than developed na^{3}na^{1} above, with a [3–] tone on its first syllable.

In a sequence of two morphemes, in which the first has a developed 3–4 couplet, and the second likewise has a developed 3–4 couplet, both of the tones of the second morpheme are usually slightly lowered, i.e. to [3–4–]; k^{w}ą^{2}ą^{2} -ri^{2} ʔu^{3}ni^{4} ^{n}do^{3}o^{4} *I will buy three sugar canes* (<k^{w}ą^{2}ą^{2} (a) *will buy* + -ri^{2} (c) *I* + ʔu^{2}ni^{4} (c) *three* + ^{n}do^{2}o^{4} *sugar cane*); the morpheme ^{n}do^{2}o^{4} has a developed tone couplet 3–4 which is almost always subphonemically lowered to [3–4–] after another developed 3–4 couplet as here.

7. Summary.

To make clear the differences between the SE and SM tonal systems we summarize as follows (for illustration of these differences, see **1.6**):

7.1. Characteristics of SE:

There are four phonemic levels of tone.[19]

[19] Some of the basic tone couplets referred to in this paper are represented by a very small list of

There are some phonemic tone sequences (phonetically glides) on single syllables.

Type (ᵃ) action (nonperturbing) is limited to certain morphemes with final toneme 2 or 3; see **2.1**.

Type (ᵇ) action (causing perturbation of certain following morphemes to higher tone patterns) is limited to certain morphemes with final toneme 1; see **2.2**.

Type (ᶜ) action (causing perturbation of certain following morphemes to lower tone patterns) is the most extensive perturbation phenomenon; see **2.3**.

Type (ᵃ) and (ᶜ) morphemes have a specialized perturbing action in special sequence types, causing certain following morphemes to be perturbed to higher developed patterns distinct from those resulting from (ᵇ) action; see **3**.

Regressive perturbing action causes certain tonemes 1 to become 2, and certain tonemes 2 to become 1, before a following toneme 1; see **5**.

Pronoun enclitics comprise four tone-perturbation groups, some of which have unique tonal rules; see **4**.

There is a marked but non-phonemic shifting of tonemes 1, 3 and 4 to lower levels in certain contexts; see **6**.

7.2. Characteristics of SM:

There are three phonemic levels of tone.

There are no phonemic tone sequences on single syllables (and no perceptible subphonemic ones).

Type (ᵃ) action (nonperturbing) is represented in all tone classes.

Type (ᵇ) action (causing perturbation of certain following morphemes to higher tone patterns) is represented in all tone classes except low-mid, mid-high and low-high.

Type (ᶜ) action (causing perturbation of certain following morphemes to lower) is extremely limited.

There is no distinction between regular and special sequence types as in SE.

There is no regressive lowering influence, but the same regressive raising influence as in SE; see **5**.

Pronoun enclitics comprise four major groups with unique tonal rules, which differ from those for SE.

There is no marked tendency for tonemes later in the phrase to readjust to non-phonemic lowered levels, as in SE.

---

morphemes. We list those comprising such smaller groups:

Morphemes thus far observed with basic lexical 1–2(ᵃ) couplets are: bi¹lu² *cat*; lu¹su² *pet dog*; sa¹ʔa² *do, make*; skʷa¹ʔa² *study*; ka²ʔ¹nu² *large (one object)*; na²ʔ¹nu² *large (more than one object)*; Nąˀ¹ʔą² *companion, one of several*; ma¹ni² *habitually, only*; ni¹nu² *above*; hi¹nu² *one time*; sə¹ə² *different*.

Morphemes with basic 1–2(ᶜ) couplets comprise a larger list, consisting of verbs which are 2–2(ᶜ) in their potential aspect.

Morphemes thus far observed with basic lexical 1–3(ᵃ) couplets are: če¹ⁿgo³ *opossum*; ba¹ha³ *macaw*; sya¹ʔa³ *let go*.

Morphemes thus far observed with basic lexical 1–3(ᶜ) couplets are: ʔi¹ši³ *a blue bird*; ri¹ki³ *woodpecker*; bi¹či³ *fan*; bi¹li³ *plaything* (in some dialects bi¹li⁴); li²ʔ¹li³ *rooster*; te¹hi³ *vulture*.

Morphemes thus far observed with basic lexical 1–4 couplets which are not loans are: bi¹li⁴ *plaything* (in some dialects bi¹li³); ⁿda²žo¹ʔo⁴ *corn stalks*; stą¹ʔą⁴ *threaten*; he¹e⁴ –ni² *proud* [lit. *proud inside*]; in addition there are such loans as: ho¹si⁴ (Sp. hoz) *sickle*; ko²ra¹li⁴ (Sp. corral) *corral*; ma¹a⁴r (Sp. mar) *sea*; lu²ga¹a⁴r (Sp. lugar) *place*; lu²ne¹si⁴ (Sp. lunes) *Monday*; ⁿdyo¹o⁴s (Sp. Dios) *God*.

Morphemes thus far observed with basic lexical 2–1(ᵇ) couplets are: ⁿdu²hi¹ *chicken*; li²ⁿji¹ *lizard*; či²tu¹ *to be full*; ko²ko¹ *will swallow*; ⁿdu²ku¹ *will search for*; na²ni¹ *will bear the name*; ka²ta¹ *will itch*; žə²ə¹ *difficult*.

A NOTE ON ALLOMORPH CLASSES AND TONAL TECHNIQUE

KENNETH L. PIKE

SUMMER INSTITUTE OF LINGUISTICS

0. Introduction
1. Tonal diversity in related dialects
2. Disparity in phonetic pitch intervals
3. Paucity of tonally unchanging morphemes
4. Specific tonemic substitution
5. Limitations in tone patterns
6. Problems involved in allomorphic restatement of tonemic perturbation

0. In the late fall of 1950, I had the opportunity in the field to check Cornelia Mak's data on the tone system of the dialects of Mixtec spoken in San Miguel el Grande and in San Esteban, with several of her informants. In addition to the striking differences in the complexity of the two systems, certain problems arose in the handling of the SE material which provided experience and/or warnings potentially valuable to other workers in register-tone languages.

1. The worker must not tacitly assume, as we did incorrectly, that dialects easily mutually intelligible, geographically very close together, and with constant trade and travel between the townships, will have nearly-same tone systems. Cornelia Mak met much difficulty in trying to use, in SE, primers designed to teach people in SM to read. Tones which "should have" stayed steady, changed, and—worse—in unexpected directions; contrasts occurred where they were not predicted, and so on. This forced her to start analysis afresh.

The Mixtec territory embraces over 100 municipalities, with an area 100 miles north to south, and a similar distance east to west. Speakers from south and west can barely communicate with one another in Mixtec. The SE and SM dialects, however, are both within the major central dialect area and are mutually intelligible. The possible varieties of tonemic system still to be discovered, therefore, may be quite large.

These differences point to interesting problems in the reconstruction of the Mixtec linguistic system—a project now being initiated by the personnel of the Summer Institute of Linguistics working in related languages: Robert Longacre, Trique (distantly related); Marjorie Davis and Margaret Walker, Cuicateco (see Doris Needham and Marjorie Davis, Cuicateco Phonology, IJAL 12.139–46 [1946]); Edward Overholt, Guerrero Mixtec; Howard Klassen, Southern Mixtec; Cora Mak and Ruth Mary Alexander, San Esteban Central Mixtec; Anne Dyke, Helen Ashdown, and Kenneth Pike, San Miguel el Grande Central Mixtec.

2. A severe psychological hazard is created for the investigator by the disparity in interval between the phonemic pitch levels 3 and 4, or 2 and 3, as over against that between 1 and 2. The gap between 1 and 2 is relatively very large; that between the lower tones is relatively very slight.

Once phonemic contrasts between pitches 3 and 4, and 2 and 3, are found structurally proven and semantically emphasized, the ear adjusts to that fact, focusing attention on pitch intervals of that NARROW degree. Having done so for the lower levels, it tends to listen for the same GENERAL degree of pitch intervals within the upper range of the voice, in any one general context.

If all tonemic intervals are equally spaced—or approximately so—this reaction is helpful. In SE, however, it leads to serious overhearing: the ear keeps noticing phonetic levels of pitch which appear quite

solid in between the higher variants of tone 1 and the variants of tone 2. The allophones of tone 1 are often easier to hear and identify than the contrastive levels 2 versus 3 versus 4. It is with decided shock, and a feeling of temporary psychological incredulity, therefore, that the analyst discovers that the pitch level between 2 and 1 is not separately contrastive, but in fact is in free or conditioned variation with the higher levels with which it is phonemically joined as a co-allophone of toneme 1.

Previous experience had not prepared me adequately for this specific difficulty. A related phenomenon, however, had surprised me a few weeks earlier. Robert Longacre made possible my listening to and substantiating his data on Trique.[1] He began by presenting clear, certain, unconditioned contrasts in analogous environments between five (roughly) level phonemic pitches. Within the contexts which he adduced, these contrasts were immediately[2] and persistently audible without effort, and in a few minutes I was able to identify any of the five (with some margin of error) in new contexts. Then a few hours later a curious thing happened: I lost almost completely the ability to identify these tones, and began to hear various toneme levels where they did not exist contrastively. We returned to the contrastive data first presented by Longacre, and that data again was clear and indisputable. The rehearing of that data, however, reestablished my ability to hear phonemically. We then were able to determine the source of my difficulty: once the total five had been checked, we had begun to concentrate our attention on certain problems which restricted our hearing exclusively to the lower tone ranges. In this process my hearing must have become refocused on a lower range in some way as the total pitch range to be expected, and, since I knew five contrastive levels existed, my ear unconsciously reinterpreted this partial range (covered by, say, three or four tones) in terms of five more or less equal intervals, some of which were now not structurally relevant ones.[3]

These experiences can be utilized to emphasize several methodological pedagogical conclusions:

(1) Pitch intervals must not be assumed as necessarily uniform.

(2) The analyst, once helpful contrastive pitch data is found, needs to refer to it often (see warming-up exercise, in Tone Languages 45).

(3) His contrastive warming-up reference list should include illustrations from the widest spread of tonemes as well as from the narrower intervals which constitute trouble spots.

(4) The use of minimal pairs, early in tone analysis, is not so much for analyzing the system—such pairs often prove nearly useless or even deceptive for such purposes—but to help the analyst focus on the general degree of pitch differences which are known to be relevant. (This purpose supplements the one given in Tone Languages 46–47.)

3. In SE it was much more difficult to find tonally unchanging morphemes than it was in SM. In SM the perturbation was almost always upward, so that high tone patterns were stable, but in SE the downward perturbation destroyed the stability of the higher patterns, whereas the rising perturbations destroyed the stability of the lower

[1] Robert E. Longacre, Five Phonemic Pitch Levels in Trique (to appear in Acta Linguistica).

[2] This result should not obscure the intense difficulty of finding the five, in the first place—a process which took Longacre a long time. I had worked on this language myself, a few years before, but in the week available for investigation had not come to suspect the presence of more than four tones.

[3] The reader may understand the point here in terms of an illustration from another field: the 'radar' scanning beam of an electronic 'pencil' can be widened or narrowed in order that it might just cover from top to bottom a line of large type or a line of small type. Thus the blind person hears the same spread of pitch responses from large type as from small, as the 'pencil' passes over it.

ones. As a result morpheme tones unchanging in every context were much more rare (or non-occurrent) in SE. Nevertheless, it became abundantly clear that even in such a language a frame technique of some sort was a *sine qua non* of ready analysis—or possibly, of any certain provable analysis at all. One is amply rewarded for time invested in seeking frames with one or more unchanging tones—and, if the language is tonal, he probably can be sure of finding them[4] if he looks far enough, in a sufficiently large number of different kinds of contexts.

It needs emphasis again here (see Tone Languages 64, last paragraph of section 1) that to be useful it is not at all necessary that a morpheme tone be unchanging in all contexts. It is only necessary to ascertain that some tone (the "frame tone" being used) is unchanging in that particular context, with that particular substitution list. In that context, the unchanging frame tones serve as a point of reference in studying contrasts within the substitution list. Changes of the tone of that morpheme in other contexts are irrelevant to proof of the number of tonemes contained in the language, provided the investigator does not assume falsely that to be certainly unchanging in one context a tone must be unchanging in all contexts. With this principle understood, the lack of stability of SE morphemes becomes less bothersome. Phonemic levels of tone found on the substitution items in one unchanging frame can be equated with equivalent phonemic levels of tone on the substitution items in other unchanging frames.

[4] At present I suspect that ultimately *no language can be tonal unless there exist within it some contexts in which one* (or more) *frame tones remain unchanged in that context*, regardless of the particular replacements of items of the potential substitution list in that particular position (but that same frame tone, as in SE, may change in other contexts). The testing of this thesis is still scarcely under way, and apparently must be handled mathematically.

4. A highly deceptive difficulty in application of frame technique was caused by a specific tonemic substitution. From experience in SM one might assume that the morpheme -de *he* might constitute a useful, unchanging mid-tone frame, in order to help one test the possibility of the existence of two phonemic pitches somewhere between high and low. Yet, after Miss Mak had made her analysis, she could see that the morpheme -de alternated between tones 2 and 3: after 2 (^{a}) it was always 2; after 2 (^{c}) it was always 3; after 3 (^{a}) it was often 3, but not always; and after 3 (^{c}) it was always phonemic 3, with slight phonetic further lowering. In other words, the frame tone often changed in accordance with the substitution items, frequently in such a way as to stay on the same tone level with it. As a result, the analyst might assume, incorrectly, that two morphemes were of the same mid height because of a prior incorrect assumption that -de did not change in tone, since a sequence of two tones of level 3 is not qualitatively distinct from two tones of level 2 in any way which allows the investigator to identify them apart from pitch contrasts in a larger sequence (cf. Tone Languages 63–64, fn. 6). The quality of vowel did not help separate the two. Miss Mak avoided this difficulty, however, since she was using the first syllable of the sequence as her reference point, rather than the second one.

This specific difficulty, as much as any other I have seen, emphasizes the care with which one must use anything other than proved high or low tones for reference until the system is fairly well established—especially in a system where substitution of tone levels is already known to occur frequently.

5. Of sixteen theoretically possible tone classes on dissyllabic morphemes in a four-tone system, many do not occur in certain of the SE contexts. This limits severely the potential contrasts to be seen in any one context. Because of the limited number of

tone patterns occurring within any one substitution list, plus the further reduction in that number through two or more patterns falling together in perturbation, very few frames contain in their substitution lists the data for proving contrasts between all four tonemes. In one of the contexts used by Miss Mak, for example, evidence for the lowest tone depended entirely on the evidence adduced from a few loan words—a circumstance which led me to view her conclusions with some reserve until in other frames the four were indisputably proved. (Later, also, in the dialect of one of her other informants of that same village, one of the lexical items appeared as 1-4 instead of 1-3, and without reference to a loan word filled in the contrasts for that frame and list, for that informant.)

For more detailed discussion of a similar problem, where perturbations void many potential contrastive sets, see Eunice V. Pike, Problems in Zapotec Tone Analysis, IJAL 14.161–70 (1948).

6. The tonal material in SM and SE can be restated in terms of allomorphs, so as to "avoid implying the primacy of the base" (cf. Harris, IJAL 10.204 [1944]). Yet, such a course within present procedures is unwieldy.

The major reason for this difficulty seems to be that—say—allomorph x of morpheme X occurs in the same environments where allomorph y of morpheme Y occurs, where the allomorph z of morpheme Z occurs, etc. Either one must be able to make simple statements covering scores of morphemes and certain allomorphs of these morphemes, or else hundreds of duplicating statements must be made for one morpheme at a time.

One solution[5] to this problem seems to be to set up DISTRIBUTION CLASSES OF ALLOMORPHS, so that a class of allomorphs can be referred to as a whole. One such class must, in fact, parallel the class of basic forms as already set up; but by the suggested terminology the priority of the base can be by-passed, in part at least. The setting up of allomorphic classes does not eliminate the need for setting up morpheme classes as well (i.e. perturbation types, in this paper), so that one may say: "Allomorphic class x-y-z appears following morpheme class (^{a}); allomorphic class p-q-r appears following morpheme class (^{b})," etc.

Statements like "morphemes of type (^{c}) have a downward pull" can be re-phrased to read: "morphemes of class (^{c}) are in general followed by allomorphic class Z, which contains, on the whole, tone sequences whose general pattern is comprised of tonemes one or both of which is lower than other allomorphic classes of those respective morphemes."

The setting up of allomorphic distribution classes eliminates much of the unwieldiness of an allomorphic approach. One problem remaining, however, may be mentioned here: In SM the perturbations themselves have achieved morphemic status in the continuative morpheme, following its loss of consonants and vowels some time during its history. The same set of changes referred to on a tonomechanical basis may be conveniently used to describe the grammatical usage (cf. Tone Languages 82, and IJAL 10.123–24). But the description of the continuative morpheme by an allomorphic treatment remains unwieldy, even after distribution classes are set up: "The continuative morpheme consists of a replacive high tone, on the first syllable of a succeeding morpheme except that on a succeeding morpheme which has as one allomorph the segmental-tonemic sequence CaCà the continuative morpheme has an allomorph consisting of a replacive high tone on the second

[5] Longacre (see fn. 1) has proposed a quite different solution which may prove more satisfactory.

syllable of that following morpheme; some verbal morphemes have dissyllabic allomorphs which always have two tones, others have dissyllabic allomorphs with only one tone, occurring on the syllable where the continuative (tonal) morpheme does not fall," etc.—though this fails to cover data of free alternation in form, and possibly other elements.

The whole problem of allomorphic description of tonemic perturbation must be discussed further than can be treated here—including, for example, problems of descriptive order in complex instances.

FROM FL (SHAWNEE) TO TL (ENGLISH): SOME DIFFERENCES BETWEEN TWO VERSIONS OF THE AUTOBIOGRAPHY

C. F. Voegelin, Florence M. Robinett, and Nancy P. Hickerson

Indiana University

14. Translation affected by different lengths of translation spans (contours)
15. Differences in morphemic content of contours
16. Contour phoneme for paragraphing
17. Stuttering
18. Contour and juncture orthography
19. The A version of the Autobiography

14. In the paper preceding this (IJAL 19.1–25) the Episodes of the same Autobiography as are here published were given in the order 1, 2, 3, 3A, 4, 5, 6, 6A, 7, 8, 9, 10, 11 in a Shawnee version (hereinafter called the C version) in which the raconteur repeated what she had heard herself say from a playback of a magnetic recording; this C version shows most words separated by very slight or somewhat more perceptible pauses written as space, and as plus juncture.[1] In the present paper the same Episodes are given in the order in which they were recorded on the tape (1, 2, 3, 4, 5, 6, 7, 8, 9, 3A, 10, 11, 6A); they are in fact freshly transcribed directly from the tape in an entirely new version which lacks all audible boundaries for words (hereinafter called the A version). The C version was transcribed from the lips of the informant; the A version was transcribed directly from the machine in the absence of the informant.

We now compare Episodes 1, 2, 3, 4, 5, and 6 in the presently published A version with the C version.[2] The contour lengths of versions C and A generally coincide, but they do not coincide in every instance. We first note the consequences of this in respect to the translation. The argument is that since contour length equals translation span, any change in this unit (length = span) might introduce differences in the final translation of versions C and A; they will of course, by definition, always introduce changes in the intermediate stages of translations—i.e. in the bracket and parenthetic translation. We are concerned in the following only with the final translation which was called in the preceding paper 'punctuated English'.[3]

Four such changes appear in Episode 1. The contour numbered 14 (with subscript 15) in the A version corresponds to two separate contours (the 14th and 15th) in the C version. There are, however, no

[1] The pause without change in vocalic tone preceding + was slightly longer than that of pause written by space—this value of + in version C is not to be confused with the value of + for version A. Altogether we have three versions, as explained in section 0 (IJAL 19.1): the first published C version, the presently published A version and a manuscript version of B, not referred to hereafter.

[2] The present A version has each contour numbered. Thus, contours are numbered up to 32 in Episode 1, up to 17 in Episode 2, to 15 in Episode 3, to 12 in Episode 4, to 21 in Episode 5, and to 46 in Episode 6. The former C version did not have contour numbers published, but they were numbered in our manuscript of C, i.e. 1 for the first bracket = contour, 2 for the second, and so on to the end of each Episode in C. We numbered the A version to adjust to the consecutively numbered C version. We inserted the numbers on the line between two double bar contour phonemes in the A version when the C version coincided with the A. We wrote subscript numbers under the line of the A version when the end of the contour in the C version appeared in contour medial in the A version. Conversely, when the contour medial of the C version corresponded to the end of the contour of the A version we wrote a, b, c after the A version number, as A7a, A7b, etc. (Finally, we added a concordance device to the C version, giving C7a, C7b etc., so that we could compare less than whole C contours with whole A contours.)

[3] See section **8, 9, 10, 11, 12** in IJAL 19.5 ff.

differences in the final punctuated translation—both the C and A versions yield "I was born, one figures out,". So also there are no differences in translation when contour A22 (with subscript 23a) corresponds to C22 and the first part of contour C23; both of these yield "There were three log houses where we lived,". So also, no differences are translated when contour A28 (with subscript 29) corresponds to both C28 and C29; these yield "was named Runs By." One difference in translation appears out of the four changes in Episode 1; namely, a comma which appears in version C is disallowed by our rules for punctuation in Version A. The change with difference concerns contour A16 (with subscript 17) yielding "was named Carrying Voice."; this corresponds to both C16 and C17, yielding "was named, Carrying Voice."

One change occurs in Episode 2; contour A4 corresponds to C4 and C5 with no difference in translation. Other than this the contours of one version correspond to the contours of the other version;[4] within these corresponding contours, however, there are some phonemic differences.[5]

In Episode 3, differences in translation are lacking when contour C3 corresponds to A3a and A3b; so also, when contour C10 corresponds to A10a and A10b. A difference appears when contour C13 corresponds with A13a, A13b and A13c—namely, a comma which is not allowed in version C appears in version A; contour C13 yields "I was certainly pleased when he gave it to me."; contour A13 yields "I was certainly pleased, when he gave it to me."

In Episode 4, differences in translation are lacking when contour C11 corresponds to A11a and A11b; so also, when contour C12 corresponds to A12a and A12b, and when C8 corresponds to A8a and A8b. A difference does appear when contours C1 plus C2 correspond to A1a, A1b and A1c. Then the C version yields "I always used to dress Indian fashion, all the time," while the A version yields "I used to dress Indian fashion all the time, always,".

In Episode 5, differences in translation are lacking when contour C7 corresponds to A7a and A7b. A difference appears when contour A1 corresponds to C1 and C2, the C version yielding "when it was winter my grandfather[6] used to", while the A version yields "when it used to be winter."

Twelve changes appear in Episode 6. Differences in translation are lacking when contour A21 (with subscript 22, 23) corresponds to C21, C22 and C23; when C24 corresponds to A25a and A25b; when C38 corresponds to A38a, A38b and A38c; when C36 corresponds to A36b and A36c; when C34 corresponds to A34b, A34c and A34d; when C33 corresponds to A33a and A33b. And also (by a curious coincidence with errors in the C version) the punctuation of C27 corresponds to A27a and A27b; C40 to A40a and A40b; C32 to A32a and A32b. Differences in translation (= differences in punctuation) appear when contour C6 yielding "Now for these four times when you go on trips," corresponds to contours A6a and A6b yielding "Now for these four times, when you go on trips,". So also when contour A13 (with subscript 14 and 15) corresponds to C13, C14 and C15a—the C version yields " 'Somebody will feel pity for you and you will see him, but you mustn't run'

[4] In working both with the informant and the tape recorder, an attempt was made to approximate the Episode 2 result throughout the Autobiography—that is, to keep the informant's repeated version (now called C) more or less the same length as the original version on the tape (now called A).

[5] This is true of all corresponding C and A version contours, and not restricted to those in Episode 2. We are leaving the problem of such one-phoneme differences for a later paper.

[6] For comparison with the A version, the translation of 'my grandfather' is strictly speaking irrelevant: it comes into the C version by transposition from another bracket, but this transposition is not made in the A version. An improved C version rendering would be; "used to" followed by comma, and then "when it was winter."

he told me. 'You mustn't run away from him; let that one talk to you,' he told me."; the A version yields " 'Somebody will feel pity for you and you will see him but you mustn't run' he told me 'you mustn't run away from him let that one talk to you', he told me." A difference also appears when contour A17 (with subscript 18, 19, 20) corresponds to C17, C18, C19 and C20—the C version yields "It was evening and began to turn dark and then I returned home. All day long I saw nobody, then when I came home I met him."; the A version yields "It was evening and began to turn dark and then I returned home, all day long I saw nobody, then when I came home I met him."

15. We give below the morphemic differences which occur between the C version and the A version. We should like immediately to give a new translation for those points in the A version which differ from the C version. However this is rarely possible since more often than not the difference is of a morpheme alternant variety rather than a morpheme substitution or addition variety. What appears to be involved are allomorphs of the same morpheme with occasional deletions on the part of the raconteur when she repeated what she had heard herself say, but failed to repeat every morpheme. There are also occasional addenda when the raconteur repeated what she had just heard herself say, but also indulged in the luxury of inserting an extra morpheme or two in the more slowly spoken repeated version. With our limited knowledge of Shawnee we cannot be sure (without double checking with an informant) that we can distinguish between allomorphs, on the one hand, and the shorter type of deletions and inserted addenda, on the other.

An analogue from English would be two versions of a text in which the first or Y version would be compared to the second or Z version as follows: English Y5 'we will go' corresponds to English Z5 'we'll go'; English Y7 'we have to go' corresponds to English Z7 'we go'; English Y9 'we shall go' corresponds to Z9 'we go'. We should, for these English examples, want to distinguish between such a contraction as 'we'll' and such a reduction as 'we go' which might be said to reflect either a deletion of 'have to' or a deletion of 'shall'—i.e. a deletion of possible full morphemes.

The main types of morphemic change between the A and C versions in Shawnee are given below for their formal interest and also for future reference in checking with informants.

The first type is concerned with short morphemic differences between the C and A versions—differences in which the length of any given addendum or deletion or reduction is less than a whole morpheme. We include in this type examples like the informant's repeated *ninyeewapitaki* which we heard on the tape as *miyaptaki* preceding the addendum *tθwi* (in C3 and A3 respectively of Episode 1); we suggest that the latter is some kind of contraction of the former. Other short changes are between *(hi)noki* (C5) and *noki* (A5) in Episode 1; between *pekika* (C3) and *pe* + *ka* (A3) in Episode 2; and in the same Episode between *(ho)-maamataatotamowaali* + *(hi)ni* followed by *waʔši talawaatileči* (C4 followed by C5) on the one hand, and on the other *maamataatotam* + *waali* followed by + *naʔ-štalwaatileči* (both parts of a single contour, A4).

Similar short changes appear in Episode 2 between contours C8 and A8; C9 and A9; C10 and A10; C17 and A17. Also in Episode 3 between contours C8 and A8; C13a and A13a; C13b and A13b; C14 and A14. And in Episode 4 between contours C5 and A5; C8 and A8. They appear also in Episode 5 between contours C13 and A13; C16 and A16; C18 and A18. And in Episode 6 between contours C2 and A2; C5 and A5; C6a and A6a; C11 and A11; C15 and A13–15; C18 and A17-18; C19 and A17–20; C22 and A21–22; C23 and A21–23; C24

and A24; C25 and A25a; C26 and A26; C27b and A27b; C29 and A29; C30 and A30; C31 and A31; C32a and A32a; C33a and A33a; C33b and A33b; C34 and A34; C36 and A36; C38 and A38; C39 and A39; C41 and A41; C43 and A43; C44 and A44; C45 and A45; and between C46 and A46.

The second type of morphemic change is concerned with deletions or addenda as long as or longer than whole morphemes. In Episode 1, *kiten?θwi* (C3) corresponds to *katawi* + *k* + *ten?θwi* (A3). In Episode 3, *peeleko špemekiiwiiya* (C3) corresponds to *špemekiiwiiya* (A3); *nimiilekwa* + *lakokwe* (C12) corresponds to *niilekwa* (A11–12); *maa* + *n(i)teliilaapi* + *lakokwe* (C13c) corresponds to *man* + *teliilappi* (A13c). In Episode 4, *nilaalenaweewašee(hi)ye?ki* (C1) corresponds to *ninaale n* + *taale lenaweewašeeye?* (A1). In Episode 5, *mkwama* + *weč(i)* (C16) corresponds to *weč* (A16). In Episode 6, *nin(i)tešiwe weneene laapiikwa nita* (C9) corresponds to *nin* + *tešiwene?* . . . *wenee* + *čeye?kweni* + *talaapiikwa* (A9). This last example contains the only transposition of morphemes within a contour recognized in the first six episodes. Also in Episode 6, *ka?kalaamoyane* (C12) corresponds to *ka?-kalaamoyane?* + *θakiye* (A12); *n(i)tekwa n(i)tekoopi(h)owe* (C15b) corresponds to *n* + *tekoopiowe* (A15b); *tehaniwanine?kiiškan (ma)tawiyeeθanineewa ne?kiiškwe he?pakičiiya* (C19 and C20) corresponds to *te* + *hanewani?kiiškweem?he* + *pakičiya* (A17–19–20); *kateški* + *nekotikiiškwe* (C42) corresponds to *kateški* + *nmaamenenepil?θeni* + *nkotikiiškwe* (A42). These examples are exhaustive for the second type in Episodes 1 to 6 inclusive.

16. The C version was given without any paragraphing whatever. We then confessed that "To date we have had no luck in finding stigmata in the FL for paragraphing the TL; hence we did not paragraph." (IJAL 19.5). A possible though unused criterion was indeed staring us in the face—but we did not see it. This was, of course, the double cross juncture treated in the C version as though it were a free variant of the double bar juncture. We now interpret the double cross, ‡, as marking paragraph end, and indent for a new paragraph thereafter.

This works without a hitch so long as there are additional Shawnee utterances which may be written with indentation after ‡. But the trouble is that about half of the Episodes end in ‡; the other half end in H (to be presently defined—**18**, below). And furthermore, those Episodes ending in ‡ in A version, end in ‡ in the C version; so also those ending in H in the A version, end in H in the C version—except Episode 10 which ends in ‡ in the C version and H in the A version. We would expect all Episodes to end in ‡ rather than H as half of them do; we suggest that a rarely uttered sometimes muttered English conclusion served as the acculturational equivalent of ‡. Then the H which occurs at the end of half of the Episodes might be regarded as not quite the end; but the evidence is not clear.

We face a paradox when a given Episode happens to end in H. Shall we classify such Episode finals in H as not possibly being in paragraph final? (Since contour finals in H are otherwise explicitly classified as paragraph medial.) Or shall we inconsistently assign such Episode finals in H to paragraph final status? (Because the subsequent new or next Episode, if any, would be said to be the beginning of a new paragraph—by a switch in stigmata, namely that paragraph initial is uttered after some kind of break, after a long interval of time.)

So far as available criteria in Shawnee are concerned, none apply to paragraph initial; the only criterion for marking paragraphs is found in paragraph final—is, in fact, the contour phoneme, ‡. Accordingly, if we wish to follow a single, consistent criterion, we must indent for paragraphs at the beginning of Episodes which come directly after Episodes ending in ‡; and by the same

token, we must definitely not indent for paragraphs at the beginning of Episodes which follow directly after Episodes ending in H.

We give below, for comparing the differences in paragraphing, Episode 1 (C and A versions) as well as Episode 6 (C and A versions). Episodes 2, 3, 4, 5 have internal paragraph identation in neither of the two versions; the already published C version (IJAL 19.7–11) is here identical with the A version. (And the Episode 6 versions—C and A—are the same in respect to paragraphing for the first 13 sentences; hence the material cited below for comparison begins with the fourteenth sentence in both versions of the 6th Episode.)

EPISODE 1, C VERSION

Oklahoma, I live there. I'm 43, now, this month. I was born there, sixteen miles east, and one and a half miles south, from Norman. I was born, one figures out, July 2, 1909.

My father was named Carrying Voice.

My mother was named Feather Woman.

There were 3 log houses where we lived, where I was born. My father was a gambling man, and, a barber. Then my grandfather was named Runs By. There, among the Shawnee, he was the one in charge of dancing. In that Shawnee town, he was the administrative head.

EPISODE 1, A VERSION

Oklahoma, I live there. I'm 43, now, this month.

I was born there, sixteen miles east, and one and a half miles south, from Norman. I was born, one figures out, July 2, 1909.

My father was named Carrying Voice. My mother was named Feather Woman.

There were 3 log houses where we lived, where I was born. My father was a gambling man, and, a barber. Then my grandfather was named Runs By. There, among the Shawnee, he was the one in charge of dancing. In that Shawnee town, he was the administrative head.

EPISODE 6, C VERSION

"You are stupid" my grandfather told me when I came home. Maybe I was stupid.

However when I had run home, I said nothing. When he said that to me, he just made me laugh.

And also at another time "You will not eat for two days" I was told, and for two days he did not feed me.

"You'll have a vision when you sleep at night" he told me. "Out of the quest you will get a vision which you will always know" I was told. And I was told "And something of what will happen to you in the future, whenever you dream then you will know, something you will do, and where you will go, if you dream off and on." Even though I did not eat for two days, one day was just all that I knew of it. Oh yes I got a vision out of the quest, since I was brought up as an Indian. I was eleven then.

EPISODE 6, A VERSION

"You are stupid" my grandfather told me when I came home. Maybe I was stupid. However when I had run home, I said nothing. When he said that to me, he just made me laugh.

And also at another time "You will not eat for two days" I was told, and for two days he did not feed me. "You'll have a vision when you sleep at night" he told me. "Out of the quest you will get a vision which you will always know" I was told. And I was told "And something of what will happen to you in the future, whenever you dream then you will know, something you will do, and where you will go, if you dream off and on." Even though I did not eat for two days, one day was just all that I knew of it. Oh yes I got a vision out of the quest, since I was brought up as an Indian. I was eleven then.

17. Stuttering is silently indicated in the C version by three dots preceded by plus;

in the A version we dispensed with the plus which has now received a new value. The remarkable thing to be noted between the two versions in respect to stuttering is not that the occurrences are necessarily found in the same places in both versions, but rather that whenever there is any coincidence, the same type of stuttering is found in both versions.

We first define the stuttering types.

The first type is identified by adjacent repetition of one or more morphemes either in the same contour or at the end of one contour and spilling over into the beginning of the next contour. For Episode 1, both C6 and A6 show *meta?* . . . *meta?θwi*. Other instances in Episode 1 are *mit* . . . *miyaptakitθwi* (A3); *we?ši* + *θo* . . . *?ši?θo* (A19–20); *kaakaakatho* + . . . *kaakaakathoweeta* (C26); *kaakaakat* + *hwa* . . . *kaakaakat* + *howeeta* (A26). Many other examples might be cited. While the first type of stuttering appears more frequently than the two remaining types, it should be noted that we have only rare examples of repetition spilling over into the next contour, as in Episode 3—namely, 1aH *e?me?* . . . 1bH *e?me?či*.

The second type of stuttering shows one morpheme or a sequence of morphemes ending in an interruption, but in a sequence sufficiently long to allow identification of the morphemes before the sequence is broken off. Thus, *melenyaap* . . . (in C12 and, identically, in A12 of Episode 2). Many examples might be cited here too.

The third type of stuttering shows a sequence of phonemes broken off by an interruption, but in a sequence so short as to allow only guessing as to morphemic identification. Thus, *šik* . . . (in A10 of Episode 6). Examples are plentiful.

Stuttered sequences—in all three types of stuttering—end in consonants rather than vowels (3:1). But all non-stuttered words in Shawnee end in vowels.

18. Double bar, hereinafter represented by H, marks contour final—but not uniquely. While double cross, ⋕, also marks contour final, it is the only contour phoneme which marks paragraph final. The contours are consecutively numbered, generally 1H then H2H and H3H and so on up to either ⋕ or H—either of which may mark the end of an Episode. (Though its function for marking paragraphs was unrealized in IJAL 19.3, the phonetic values there assigned to ⋕ remain without change in the present A version.)

Double bar includes in its definition contour-length phonetics and also adjacency phonetics. A two dimensional feature of the latter is found when H is in contour final. In this position, H is heard as a rising tone on the last vowel before H; and as a continuing whisper after that final vowel which is voiced—a whisper which is somewhat more fricative than the phonemic intervocalic -h-. A one dimensional feature is found when H is in prevocalic contour initial. In this position, H is heard as an on-gliding whisper before the initial vowel which is voiced—a whisper which is not distinguishable phonetically from the phonemic intervocalic -h-.

In such sequences as H7H or H8H or H9H, the H before the contour number is obviously in contour final, while that after the number is in contour initial.

The first contour in an Episode may be 1H—it could scarcely be H1H, since the first H in such a sequence would make phonemic reference to a preceding contour which, by definition, is absent in Episode initial. (But this leads us back to our paradox—**16**, above.) So also, the first contour after the end of a paragraph might be 5H but could scarcely be H5H. (Actually, the sequence would be double cross, ⋕, followed by 5H, for example; but the line beginning 5H is indented for paragraphing after the line ending in ⋕.)

Another possibility exists—namely, a contour initial vowel without on-glide whisper; this is represented by the non-appearance of H. The first contour of the first Episode is a

case in point (1 oklahooma + nila H)—the contour number, namely 1, is not juxtaposed to H. If the orthography were to make this juxtaposition (1H oklahooma + nila H), we would read an unuttered initial h as our phonetic response (hoklaho·man·ila^{h}) to the phonemic directions.

Plus juncture, +, will be defined exclusively in terms of adjacency phonetics. In contrast to previous usage, it has the following values in the present A version: lengthening consonants which follow and shortening vowels which precede. Hence plus checks open syllables (when it occurs after a vowel but before a single consonant), and more generally, whether in this distribution or in interconsonantic distribution (when it occurs after a continuant but before a stop), plus indicates that the following consonant is anticipated, as it were. Continuants following plus give the impression of being twice articulated, and all consonants after plus are longer than otherwise. In the sequence + -stop, the stop is unaspirated; in the sequence + -stop-stop, the first stop is unaspirated and unreleased.

19. The present paper gives the conditions under which the A version was obtained (see **14** above) and gives some differences between this A version and the previously published C version (see **14–18** above). In general the first six Episodes of the two versions are used as our sample for noting the differences. However, all the Episodes of the A version now follow.

SHAWNEE EPISODE 1

1 oklahooma + nila H2H očilenawe H3H mit . . . miyaptakitθwi + katawi + k + ten?θwin . . . H4H inoki H5H neen? . . . nokiyaamakiša?θwa #

6H meta? . . . meta?θwimaalik + tenekotwa?θwi H7H e + ta?koθakino?ki H8H n + kotimaali + k + tepa?θi H9H naaminooči H10H nita?maačilooθiya H11H laapilaikiiša?θwa H12H niišwilakimooθo H13H tepeek + tečaakat + θwik + tečaakat + θwikθwik . . . H14H tθwakita?θoowenim + piin$_{15}$en + maačilooθi #

16H nawali?šimo$_{17}$ + ši?θo H18H no?θa H19H n + kotipiiwe?ši + θo . . .$_{20}$?ši?θo + nikya #

21H n + θwi H22H θoote?kwikaan$_{23a}$e + taayaaki H23bH n + ta?maačilooθya H24H talawaatiiwilenino?θa H25H no?ki H26H kaakaakat + hwa . . . kaakaakat + howeeta H27H we? . . . wen + me?šoom?θa H28H pemipto + $_{29}$šiθo H30H maamenyeel?čikeeta H31H laašaawanwan . . . H32H n + taši H33H owiisi?taani H34H šaawanwa + teeweniki #

SHAWNEE OF EPISODE 2

1 ina + ye?kin + me?šoom?θa H2H taatotam + waalino?θali H3H pe + kaloole + tiiwe H4H maamataatotam + waali + na?štalwaatileči H6H tθene?waapaki H7H pa + yeekwa H8H taaša + te + he + taakino?θa H9H niniiš + ki + ša?θoowi H10H nipiičinaalekwa + nime?šoom?θa + peeleko + howeewaapaki H11H n + noošaalekwa H12H melenyaap . . . meekiiθiimelenyaapo + ye?kin + maamen + hekwač + hine H13H lok + haanaaponeši H14aH no + šaaθ . . . ne$_{14b}$?šikaten + čin + me?šoom?θa H15H e?maačilooθiya H16H n + meta?θwi + ka + toowik + te H17H kiteniišiweč + nenipaš + kooliiwe #

SHAWNEE OF EPISODE 3

1aH e?me? . . .1bH e?me?či H2H nataw?kyaačina + nime?šoom?θa H3aH niišwi? . . . niišwi H3bH niišene + špemekiiwiiya H4H wiikiwaa + štaakoolikapenaleeli H5H i + nita?noošaašiči H6H peelekoawaapakin + taleelepwa?ka H7H n + yeewi + katoowi H8H kinye + katoowiiwen + tekwa H9H nime?šoom?θa H10aH o?kwaawi H10bH tekwak + hwikaneki H11H waniič + lowaanan$_{12}$ + niilekwa H13aH amam? . . . ka + konooš + lepwa H13bH e?miile + čiwa H13cH man + teliilaapi H14H akwim?šiikiwaapekye?taayaake H15H maatašin + šaapikaakikan + te + la H

SHAWNEE OF EPISODE 4

1aH ninaalen? . . . ninaale H1bH n + taale H1cH lenaweewašeeye$_{2}$?kaakika H3H tθene?waapaki H4H eškwe?θeeθiiwiya H5H ninen? . . . nilenawiinoošaaleko?pino?ki H6H e?kolaawaapaki H7H piileški + ye?kin + taaya H8aH wiikinaakwimwan?ši H8bH kipo?ka + twi H9H nipaapaam?θepiileškipa?θikiiškwe H10H n + tašin? . . . n + taata + leθiwenin + ka? . . . wenin + šaaješkal?θite H11aH n + kaaka? . . . n + kaaka? + sal?kiiye?ki H11bH apa + šineeθa H12aH e?weepiiki H12bH e?kola?-waapaki ※

SHAWNEE OF EPISODE 5

1H e?pepookii$_{2}$ye?ki H3H e?kooniwaakikin + taatitep + šimekwa H4H nime?-šoom?θa H5H nyeewene H6H e? + ta? + koθakiwa + yeeči H7aH n + taaši H7bH tetep + šimekoopi H8H ke?wi + šikilenaweewi H9H n + tekw . . . n + taayokwaaye?ki H10H mataškanoki + ktaha + θiikwen + taayokoopi H11H etetepšimooθoya H12H ekola? + waapaki + no?ki H13H nipaapa?lel?hekoopi H14H θiipiiki H15H pela?či H16H paapokhooθokoonaawečhinen? . . . n + tay?pakilekoopinepikiya? + šoolelwi + ya?kočitaat . . . kanwiye?kinepi H17H weele + lwiiya H18H ke?wiš + kile + naaweewi + ta + yekwapa + yekwa H19H no? . . . nime?šoom?θa + n + waeči H20aH wišiki + te + heeya H20bH eešiwiičikeemakin + ta + ši H21H eetaayaake H

EPISODE 6

1H peeleko + šiwaapaki H2H e?šalaapiikwahaano?ki H3H wen + me?šoom?θa H4H pelačin + tekwa H5H kiiwi + ta + mooleyehi H6aH n + tekwaano? . . . inokiwamaanyeeweni + nokeši H6bH šašipaam?-θeeyani H7H pela?činoktikeewi?θenikola + waapaki H8H a? + špaawaapθeeyaanen + tekoopoowe H9H nin + tešiwene? . . . weneene + čeye?kweni + talaapiikwane?kiiskwen + paam?θe H10H weneešičin + me?šoom?-θa? + šik . . . wa? + špaan?haaya H11H kamoočiwiyeeθa + nokike?neewaašiwaapakine?kiiškwematei?θen . . . matei?θeniyanenoki H12H ka?kalaamoyane? + θakiye H13H wiyeeθake?kiteminaakweelemekwake-?neewaate + k . . .$_{14}$te + kpeekwake? . . . ke?memekwin + tekwa$_{15}$tekik . . . te + koošimaawiilaanike?kaloolekwa H15bH n + tekoopiowe H16H ne?kiiškwenipaam?θe H17H maateeθiw$_{18}$aleepepekičiaač + hinen . . . n + piičipakiči + $_{19}$te + hanewani?kiiškwee$_{20}$m?he + pakičiya + čine + nak + škawa H21 wiyeeθa + p . . . n + piyečineewa$_{22}$paaši? kwaašinaakoθiči$_{23}$ma + la + kwa?piyaačiowe H24H ni + kaloolekwa + tapaakwa + nootawa + yoči H25aH ničišhekwaanikwakomemikwinwaatama H25bH tanwaakote + ši H26H wa?šilawiyaan + tašiiyete + špe + tekin + pa + ki + čiipto H27aH nimoyale + toke H27bH kimoyalen + tekwan + me?šoom?θan + hika? + piyaaya H28H e?me + kwiiyapa + yekwa H29H taayehin + teyo H30H te + škinikila + k . . . mikila + kkaakwa H31H ni + hišiči ※

32aH we H32bH weno?kiilaakwa H33aH ino + k . . . ino + kitaktaawi?θe + n . . . niišokon + tekoopiniišokotanič . . . H33bH hamekwaawe H34aH ke?wišika?powa + k . . . nepaayanitepe?kin + tekwa H34bH wiška?powaakwa?či H34cH ota + tenan + tekoopike H34dH waawaakota H35aH wiye + hi + niikaani H36aH wi + ša H36bH wi + ša + ši H36cH šašinamane H37H a?-powaane H38aH waapeta?la + kwakhaapo + wa H38bH kwala + kwa?powaanwae?ke H38cH ke?waakotawa + wi + ša H39H ši + lawiiyanewiyehiša H40aH wiša + haayane H40bH n + tekoopowe H41H weniišokooθepita + nwi?θeni H42H kateški + nmaamenenepil?θeni + nkotikiiškwe H43H nipe? . . . nipe?šiwaakotama H44H wiška?po + waape?no?ta + tene + ši H45H lenaweenoosaalooθoya H46H ne + k . . . ne + kotwa?θi + kkatoowilaakwaanee ne ※

SHAWNEE EPISODE 7

1H niniišwa?θi + kka + toowo + we H2H nimeki + ntehe H3H yaaši H4H la +

wiiyaaninekotwa?θi + kka + toowiiya H5H payeetowama + ta H6H nime + taate + šinoošaalooθoya H7H noowešilepwa $k_8$kateški H9H no?ki H10H n + θa + θayaakilenaweewi H11H laašamamo H12H nimente + heno?ki H13H paaši H14H leelepwa?kaatawiyeeθa H15H eešimen + te + heeya + no?ki H16H me + čiwi + yehi H17H meči + yehiweewaakota + ka H18H pawe + wwa H19H yeešiaašama + moya H20H neeč . . . neeči H21H šipaametaatama + šinoošaašiči + nime?šoom?θa H22H nimaamawaapipe + ye?kino?ki H23H tθene?melo?ka + meki H24H e?pa?menyeel?čikeečiini H25H šaawanwaka + ta?menyeelowaači H26H niwaawaapamaakile + naweeki H27H e?menyeelowaačikateški H28H ma + ta + wi + laani + nšaleelemakwa?šimenyeeleo + θaami H29H kimaačiloo θi H30H nite + kwaša? . . . wiišaala H31H ka + temo + yena + wečhine H32H na?θaapi H33H ke? . . . maamenyeelen + tekwan + me?šoom?θa + neečiateški + naalematapi + nwaawaapaki + ye?ki? + menyeeleki H34H meekiiθali + nnaana?poolekwa + ye?ki H35H nime?šoom?θa H36H wi + koči + nwiikpomeekiiθa H37H e?maamen?hooθoya H38H meekiiθiim . . . melenyaapo? + maačiloo θiyawenθiteewiikwpomeekiiθana?θaapi ※

SHAWNEE EPISODE 8

1H kapenaliiya?ki H2H omaamiilaali + nme?šoom?θaličaakiyehi H3H e?me?či H4H nataw?kiyaaleči H5H teetep + θekino?ki H6H mhšeewehi H7H pi?šaakana H8H omiilaaliwa?ši H9H kateepaam?θeličiya?š . . . yahaači H10H ta?tepoweeleči H11H meem?šeeleličiwiyeeθ + hi H12H kša + kewiila H13H om? . . . kša + kewiila H14H owiiši?tooni H15H laašaawanwaoteeneki H16H yaaši + menyeelekino?kičaakiwiyehin + ta + ši H17H yaaši + tepoweeki H18H wilamamaatoma + hi H19H e + taačipaapi + hi H20H le + nawehi H21H teetepeelemaači + nime?šoom? . . . θapaaye + kinaanootike H22H laakwayahaači H23H kaakam + paapa? + wiitθeemamooche + pa?tepoweeči H24H e?šamenyeeleki H25H n + taaya?kawe?šeeye?ki + ye?laačimočiya?ki + nime?šoom?θa H26aH yeeši H26bH yeešiaačimo H26cH eešaačimo?tawaači H26dH yeešaačimo?tawaači H27H ote + le + naweem + hi H28H iya?šilenaweewiličino?kilaakwa? + menyeeleki H29H nitaaya + meškaakwa + ye?ki H30H pa?waniitehilentaayokwa + taayokwa + paapa? . . . paapaalam? . . . lamita?θalaakwašpiit + θa H31H taawi?θenikiikiweela + p . . . H31bH otaanaakiikiwaapekinaaniipawwi + nikaakiimi H32aH a?kawe?tawaakilaač + paš + tooθakiiye?ki H32bH tawawaakota + nime?šoom?θa + $_{33}$payeekwa H34H mata + nimetaataanokiiši H35aH a?kawe?šeeya H35bH k + šake H

SHAWNEE EPISODE 9

1H yaš + kaani H2H tepoweewe + ntaatota H3H neelaakwata?na + kkaaya H4aH + nime?šoom?θe?paapa?tepoweeči + ye?kitepoweewilenihi H4bH e?naanaakškawaa H5H nwaawapamaaki + ye?ki H6H tam?šeelowaačilenaweeki H7H maomahi H8H yhkwehit . . . počileewe? . . . počileewiy?kwehi?komaamahiwa?ši H9H ta? . . . ta?tepoweeleči + na?θaapi + nitaši H10H yhkweeki + ye?kimaam + p · · · paapiyetoonaawayeha?miičiyaake H11H layikiišeki H12H a?šwi?θeniyaake H13H ne?kiiškwe + ntaši + nntaataleθipeenita?tepoweeki H14aH a?š · · · H14bH a? + šamenyeelekikale?melo?kame?θike?štakhwaanekaakiini H15H we + ne?kipo + čileek · · · po + čileekipaapi + yekiwa + pa + ya + tamaakohi me?šoom?θawa?ši H16H aačilaakwa H17H ta?ma waš + kaakiweninyaa · · · $_{18}$paapiyečina?θaapi + nitaayaawini H19H a?šitakhwaanekaakiini H2OH otaayatotaanaawa H21H nekoti H22H po + čilino?ki H23H okimaana + wapeekawilawiši?ta + nime ?soom?θa$_{24}$taatanawon?ha?šimenyeeleki H25H e?šimelo?kameki H26aH waawaapake + ye?kita H26bH menyeeleki +-

paapahalawiikiikileniiki + nitašimetaθwi H27H ki + teniišwileniikimaamooθookino ? + kmeta?θwi + kteniišwiy?kweeki H28H ya?ši H29H oš + toowaačitak + hwaana H30H eešitak + hwaanekaaki H31aH eme?čit ··· H31bH eme?či + tak + hwaanekaawaači H32H eno?kwaakwaškamaweeki H33H pela?či H34H e?tepeki + no? + kmaamenyeelookičaakiyaaliilekaake-?tepe?kiki H35aH ewe ··· H35bH opešhani?ki H36H ileniiki + niišokopaapahala + wiikiwe + čnepaapiyekiwaam?kate?θooki H37H meθ + hiikiyaai H38aH wee H38bH laapiikwa H39H kaa + kke?šiiki H4OH niišo + kowe?kweeki + taatakhwaanoowaatoonawanilaakwaši H41H neenikaanekaačimeta?θwi + kkiteniišwi H42H mhšitakhwaanoowaašitoonaaweeleniiki H43aH mičopaapiye + laawahi + leni? ··· ?a ··· H43bH anikhwaale?θeelooliči ⁂

44aH owe ··· H44bH e?kiišelo + waači$_{46}$wečhinemaameniilookino?ki ⁂

SHAWNEE EPISODE 3A

1H niniišwa?θwi + kkatoowiwe + čhineenineewa + teko?šiya H2H peelekowaapani H3aH eečini + θapayaanan + tašipiyeewa H3bH payekwa H4H ni + čišhekwa H5aH ma + takeenaan + čišhekwa H5bH kookweene + ha + yaaman + teštehe H6H nipiitθeeptokateški H7H o + taana?a ··· piitikeeni H8H wikwaapeki + nniipawišaaponeekiikinooči H9H waapamakateškin + taal? ··· n + taali H10H n + taaliwaakota + ši + wiyeeθaθapaayonayečini H11H šaawanakotee + čniimwaali H12H payeekwamatan ··· niwaakomayme-?čiweepθeeči + čine + nwiitamaakoopi H14H we + no?kom?θa + no?ki H15H mata H16H na?θaapiilonootawahiteko?ši?hi H17H pemikaaθwio? ··· kaaθwiolaaθaki + piitikea?ko?kokioolaaθaanikaaθwiowe H-18H inayečinin + taši + piyeewa H19H ke? ··· ke?teephelakaaθepata?ta + holaaθ-manikaaθootelaali H20aH we H20bH oweyaw?wiyakwe? + tawaalino?kom?θa H-21H čaaki + yaaman + tekwa H22H niwaapalaačimekwayaama H23H kweeneeeθayaamakšake H24H o + telaali + nime?-šoom?θali H25H a?θepatin + tekwaš + teheθapaayo H26H kaaθepatiiwaana H27H a?θepatin + tešinaape H28H a?θepatiikiiwe H29H we?kaaθe? ··· kaaθepatešiiθoona H-30H kaaθepati + θapaayomat ··· θapaayona + kaaθepatootekooliya + kweelano-?kom?θapayekwa H31H inaleelaapaa + čmo?taana H32H niši? ··· niš ··· čikile + šiθoon + ši?θa H33H naanaa + nlaapa? ··· laapaa + čmo?taali + nime?šoom?θaliineene H34H kaašekiki + pa + yekwa H35H om? ··· niwaakotaapeθapaayoma + ta H36H waapalaačimooθono?kom?θa H37H pa + yekwa H38H oweškaloolaale?me?či H39aH e?me?či H39bH tepa + šayeetamaawakoči H40H e?koči H41H wečhiine H42H mata + yehiwa + no?kiwepakčineečini + θapa?šipaškooliiyaš + tehepa + yekwa + nime?šoom?θa + pakči?kaatiimaalii + tt ··· ma + ta H43H mataama?-paškooliiwinoošše?θa H44H n + šalenaweenoošaaloo + ttelaweničipaapaškooliiyaakeločhiine H45aH e?me?či H45bH ašiki + nme?šoom?θawečhinen + paškool?hekwa + no?θa H46H ni?koči H

SHAWNEE EPISODE 10

1aH e? ··· H1bH e?me? + čmenyeelowaačiwečhineno?ki H2H petekiyaayeeki?kweekowaa + štoonaawapikamite H3aH ani + k ··· H3bH anikhwime + člaale?θeelookiweleniiki H4H paapa?nanahiikipela?ča? + šmenyeelowaačino?ki H5H e?kiišelowaačiowe H6H e?me? + čmenyeelowaačiwečhine H7H takhwaanotaš + poonaanaawa + ni H8H šoošoonekiwa?kwi?θetoonaanaw?hanikhwi + wečhineno?ki H9H laalematapiikičaa + kni?kile + niikimaayeta?-kwe H10H a + škaata?kwelematapiikiy?-kweekino ? kaškaata ? kwelematapiikiwe H11H e?me?čimenyeelowaačiwečhinenipaapa ? miiletiikitakhwaanaaniikhwino ? ki H12H oweškilawe?θiiθakimaalaakwa + hiinita?ta + kwaakiško + teta + pkaleeki + nta + šlaalematapiikiowe H13H e ? me ? čimiiletiikiwečhineno ? kimaamenyeelookieme + čminyeelowaa + čoweka-

akwaškamaweekime? + čikwaškamowaačiwe H14H paapak + čiikiowe H15H pela? č + paape + kkalawipeekwaya?ki + nme?šoomθa + šipa H16aH pakičiiwaači H16bH nihilh ··· H16cH meem?šeeleliči H16dH ni + wi + koči H

SHAWNEE EPISODE 11

1H neewiški H2H nipaškooliiwino?θa + nte + šiwelekwataškooliiya?kočipayekwan + taatekweeθi + ye?ki H3H e? ··· kšaken + laale + na + weewaše H4H nitekwe? ··· nitekwe?tawa? + nitekwe?toona H5H e + lašeeya H6H teko?šiya + kiikinoowaapamekooki H7H weekwonwaawi?θa + kwe?waapamiwaačikšake + ntaatekwiiθikaakika H8H ta + nteko? + šeewaatowe + no?ki + nkaakiči H9H nikaakičika + ke?kinoo + t ··· tenamaakwa H10H nišaaškoolhhiweema H11H a?šinootawa + kiyehipeekwaaška H12H matan ··· mata + ntepašaweelete + šiškooliiyakšaketa + nnootawaakiteko?šiyaki H13H wiyehišiwaači H14H wiikinaakwinil?škimekookiyaš + kamata H15aH n + ta?nootawa H15bH kša + keta + nnootaake H16H e?teko?šaatoweekipayekwa + nwaawešilepwa H17H e?paškooliiyaano + ki H18H teepi H19H nitelaatoweno?ke?ši + kilenaweewiya ⁂

20H owe H21H nišaašiišiktaakoopi + ye?ki H22H nitayekeepičikana + ne?ki H23H škooliiθaki H24H čaaki + ntay?penalekooki H25H m ··· tanwaaweleeletawe H26H peeleko?paškooliiyama H27H matan?hiikanipyanootanikiiweepaakila + nipaam?θelaapiikwa H28H ne?kiiškwe H29H nitkaapamaakiškooliiθake ? pem ? θeewaačiwičhinenipaki + či + petekino?ki H30H paalohi H31H nahiika + piyeeya H32aH a?taa ··· H32bH a?taa ··· H32cH oštoočino?θa H33H eekaateewaliče? ··· če?hapaayomatala + mpaapaškooliinil?škimekwa H34H ala?mata + kipaškooliiwin + tekwamatan + tela H35aH o + wečinečin + taamweelekwaš ··· paakilen + te?paš + kool?hekwal? ··· H35bH mhšiškooleekaaneki H36H šilaakon + te?paš + kool?hekoopi + ntašhe?θi H37H čaakatθwi + kkatoon + škooliiwe + činen + kateeyaška + nokimata H38H niwa?kota?šteko?šaatoweepayeekwa H39H niinoki?kočahaatotamama + šowaapaki H

SHAWNEE EPISODE 6A

1H peeleko H2H laakwa H3H pašitooθa + ye?kinanataw?čikeeta H4aH no?kooč ··· H4bH očeepkiiwileni H5H owešitaakteliina H6H šaawana? ··· šaawana + kootaakteliimowaalipa?θi H7H omaškono?kipa?θišaawanwa H8H wešitaaktelipa + yekwano?ki H9H paapemoškwaačikeeta H10H kileki H11H nitaši + ye?kikaakika + paapiyeewa H12aH apaanaw?haali + no?θa ⁂

12bH ya?kali + nime?šoom?θali H13aH otaačimo?tawaa ··· H13bH otaačimo?tawaale?θi ⁂

13cH n + ta + še?pa?na?hiweeči H14aH nitaaya?kawe?tawaaki + ye?ki H14bH haačimowaači H15H pa + yekwa H16H matan + tašimakwθeeleta H17H eelaačimowaači H18H eem? ··· no?kiilaakwapiyeewan + taši H19H pe + te + ki H20H wene? ··· ineešičhiina H21aH či + tooθa H21bH taakteli H22H kee? ··· piyaalomaataši H23H laateetakwal? ··· wiyehike?čiikinamoole H24H n + tekwa H25aH a ··· H25bH eya?kawileni? ··· eya?kaiwileni + niila H26H kee? ··· peepaaneme ··· talaakwe + ye?kinememaata + šiimaawiyehi H27H yaašinaakwatkeekinokikiilake?čiikinamoole H28H n + te + neniwi + keela + niila H29H iwaana H30H naanataw?čikeeta H31H pθiiweni + hio + pa?niimem?ka + teewapake?θiiθenwinipeewini + hi H32H ma? ··· ma + laakwa?maataš + ke?lemata + pin + tekwaan + taši + nlematap + maalaakwahiowe H33H alo? ··· weenipθiiwe H34H mwatel?šeekina H35H nyeewene + maotelila + tenaačhiine H36H owaapamaalino?kik + ša?θooliowe H37H ilowešilai + kiišekiinaao + pmaalilik + ša?θooli H38H wečhinema? ··· wečinookčiipileenik + pθiiweniheem?kateewaaki H39H paat ··· o + t ··· oteliila + waali H40H ?o? ···

oteliilawaalee + šinaakoθiliči H41H ?aa? ··· weepikwali H42H mem?kateeθiliči H43aH inečooš ··· H43bH očooščikeenipθiyeni + hweč ··· H43cH ineno?ki H43dH telilo? ··· ?owe?komaalin + li H44H weepikwalotelilo?tawaalowe H45H ničišhekwaanaweepikwan + tašipaam? ··· pi + čkwakwamemekwikočim?šikilwa H46H waakateški + nkilla + kkawaayoomataakteliin + hiw?no + ktešilawi H47aH o? ··· H47bH oθepaaye?šin + tekwa H48H ničišhekwaana H49H weep + šiweepikwa + ntela H50H če?mataanaweepikwan + tekwa H51H ke?awpamita + hini?po?ta + tama H52aH pθiiwenihiinin + tekwaniya + ke? ··· H52bH o + waapamine?po?ta + taanipθeenehi H53H owe H54H weeweepθeeyan + tekwaa ··· H55H om? ··· kwamaate?po?taataapθeenin + talaakwaanaweepikwatan + newaa + kteeni H56aH peekwa H56bH inikeelaleš + ma + netoowiyan + tekwa H57H hinačtooθa H58aH nne + či H58bH neečiwaakomaki H59H e?šilenaweewiči H60H peelekolaakwaakala H61H wiiloon?θaali + nime?šoom?θali H62H n + tašipiyeewa H63H mo + ni + šaataamaalimata + šaw?hekooli H64H wok ··· okiišθekoolime?šoom?θalee ··· H65H peel? ··· ew?kočim?šikoonine + tepe?kim?šeelokonaθaakiči H66H ?awp ··· n + tašipaam?θeena H67aH či + tooθa H67bH kweštepe?ki H68H niišwilaakopiyaakša?θwa H69H n + tašipiyeewa + nepeešhaali H70H nime?šoom?θalin ··· no?kom?θali + no?ki H71H aalaalamooki + neeyiišwi H72H ?anilapehi + ntamamonlape? + nwiiš ··· n + taalinepeešhekwaan + tamamon + waapamapiič + hopiič + tawenaaniškwaate H73H pi + ma?kona?hooteekhi + niškwaatepiitikweeta?kopa + yekwa H74H yaška + teepo + tawena H75aH paaši H75bH paašim? ··· mhweewa + ši H76H e + la + hoo + takipeekwae?piitθaači H77H paašim?kwa + šinaakoθiče?piyčipiitθaacin + $_{78}$šačišhekwa + tapeekwan + čišhekwan + wiišikwitehen + waapama H79H ni + nenawa + no?ki H80H šiwiyeeθa H81aH peteki H81bH e? ··· H81cH a + tale?θ ··· Y81dH le?θeeloowikaaneki H81eH eewaapeteki + no?kipiyeewaaowe H82H welo?θečhiine H83H e?me?čilo?θaačiwe + nme?šoom?θa H84H nikaw?šineewa H85H e + hama + moočiwe H86H pšipkaleenamwa H87H štooθweeki H88H wečhine + šekšinwaat ··· pakačiništooθwiikiiniin?ši H89H nyaalnop + takme + ntilaakwan + ta + šškešinawae H90aH θak ··· θakteeniokkooteemi H90bH keekootiho + čim?ši + kooti H90cH we? ··· H90dH e?θakteekiowe H91H on?škaaptokoko + memekwipa?kaakaawačiptookiwaapeki H92H tθene?pem + ptoočiko? ··· š ··· koona + li H93H koonalin + poapkite?hwa H94H noole + čeenaanakoona H95aH nipaapkite?kwaan?ša?n + šakoča? ··· H95bH a?teenamowaani H96H o + piitenikanpaakopaalo?čaakate + teeli H97H wečhii? ··· wečhinenakipakθe H98H weena?kino?kom?θooθaami H99H kki + le + nawa?ši H100H a?te + hamowaačiopitenikanakšake H101aH pooθino?kin + kaakči H101bH naathaape + ne + pi H102H nekote?θepa + tiima + lakwa + t ··· n + taašinaathaapeetalaakwani + pwaači H103H θiikhapiyaalakčioweniiči H104H kčiko + k + memekwe?čaaka + teteeki + čnen + lokitenikanaa$_{105}$nakpakθaawe H106H + weniiši H107H piitθeeptoočipeekwa H108H mataš + nataw?halina + taaktelikšakeewīle?penalaa? ··· wila?penalaači H109aH e?ši H109bH kišθeko + čiowe H110H niišokokateški H111H le + naweewi H112H nime?šoom?θaawe H113H a?šenwa ※

TEWA II: VERB STRUCTURE[1]

EDWARD DOZIER
UNIVERSITY OF ARIZONA

1. Introduction
2. Verb structure
3. Verbal base and tense-model enclitic
4. Pronoun complex and verb theme
5. Independent pronouns
6. Final and pre-final verb stems
7. Subsidiary elements
8. Examples of verb themes
9. Zero pre-final verb stem
10. One pre-final verb stem
11. Two pre-final verb stems
12. Three or more pre-final verb stems

1. Three processes in reference to Tewa verb constructions are apparent: Pronouns occur prefixed to verbs, stems are compounded, and tense-modal elements suffixed. Examples of verb constructions, particularly those with several pre-final verb stems, clearly illustrate these morphological processes.

The dialect considered in this paper is that of Santa Clara Pueblo.[2] Though the writer is a native speaker of Tewa, this study is not based on his speech alone; it has been supplemented by considerable work with other native speakers. Tewa spoken in the pueblo of Santa Clara differs little from that of other New Mexico Tewa pueblos.[3] This difference is becoming even less pronounced today with facilities of modern transportation and the resultant increase in inter-village relationships. Inter-pueblo marriages are also much more common today than formerly; the boarding school and the Indian Field Service are bringing individuals of different Tewa pueblos into more intimate contact. More recently employment in the Atomic Bomb Project at Los Alamos, which draws workers particularly from the Espanola valley, has increased this relationship.

Although recent happenings have produced homogeneity in the language, they have also had disorganizing effects on the language. Contacts provided by the Indian Service and Los Alamos have not been restricted to speakers of Tewa alone. Intimate relationships with non-Tewa pueblos and tribes have also resulted, and more important, contacts with Spanish-American and English speaking individuals. A large number of marriages with non-Indians have resulted. The children of these families who make their home in Santa Clara Pueblo learn the language from everyday contacts with native children, but this is not, of course, possible for children of families who live away from the pueblo. The tendency of families of the latter group is to use the language of their community. In most cases this is English; however, where one of the parents is Spanish the language may be Spanish.

Like most New Mexico Pueblo Indians, Santa Clara speakers have passed through stages of bilingualism and trilingualism. All of the older individuals, seventy years of age and older, speak Tewa and Spanish. The

[1] The present paper is a revised and abridged version of the writer's M.A. thesis entitled: A Tentative Description and Classification of Tewa Verb Structure. For valuable guidance and constant encouragement in his linguistic work, the writer is indebted to Harry Hoijer; and for financial aid to the Social Science Research Council and to a John Hay Whitney Opportunity Fellowship.

[2] The phonetic symbols employed in this paper are the same as those described in H. Hoijer and E. P. Dozier, the Phonemes of Tewa, Santa Clara Dialect, IJAL 15.139–144 (1949).

[3] For the position of Tewa in the classification of American Indian languages see paper cited in fn. 2 above, and H. Hoijer, Introduction. Linguistic Structures of Native America, VFPA 9–29 (1946).

next group, from about forty-five to seventy years of age, are trilingual; they speak, Tewa, Spanish, and English. Individuals forty-five years of age and younger speak only Tewa and English. This interesting transition has taken place because prior to statehood (1912) New Mexico was predominantly Spanish speaking. Pueblo Indians have been on intimate terms with their Spanish-American neighbors during the major portion of their historical contact, and, whereas today both groups use English in their relationships, in earlier times Spanish was the medium of communication. The children of the early part of this century were still in the atmosphere of an older tradition, and also exposed to the Indian Service boarding and day schools conducted in English. These fortunate individuals became, as a result, trilingual.

Tewa lexicon is little affected by either Spanish or English. The language is particularly well equipped to express more recent concepts in the native language and to express, in native terms, borrowed elements of material culture. Although a speaker of the older generation may use Spanish to make a statement more explicit, and the younger one English, such instances are rare and the native speaker clings zealously to expression in purely native Tewa.

2. Tewa verb structure is a complex subject not easily explained in a brief discussion. In this paper primary attention has been given to the verb theme; the remaining structures can only be given a brief and tentative discussion at the present time. In terms of the verb theme, Tewa verbs fall into several distinctive classes.

3. A verb construction (any free verb form) may be divided first into a verbal base and a tense-modal enclitic. Isolation of the latter is not syllabic, but morphemic, for the tense-modal enclitic is nearly always fused to the final verb stem. Thus, in the example: ʔi-wínuh *he stood up*, the tense-modal enclitic (past completive, perfective mode) is expressed by the form of the final verb stem wínuh *stood up*.

4. A verb construction minus the tense-modal morpheme is the verbal base which expresses the lexical meaning of the construction. The verbal base may also be divided into two parts: the pronoun complex and the verb theme. In the example above ʔi-wínuh *he stood up*, ʔi *he* represents the pronoun complex and wínuh *stood up*, the verb theme. The pronoun complex defines the construction in respect to subject-object relationship, person, and number (singular, dual or plural). ʔi *he* in the above example expresses actor, third person, singular. The pronoun complex is always prefixed to the verb theme.

5. There are six independent pronouns in Tewa which may be used separately like English personal pronouns, or which may be placed in front of a verb construction for emphasis. These pronouns are: nàˑ *I*; ʔùʔ *you*; ʔìʔ *he*; naʔìn *we*; ʔùn *you*; ʔìn *they*. No distinction is made between *he*, *she* and *it* in Tewa. Duality, an interesting feature of Tewa pronouns, is expressed by prefixed pronouns in the plural categories.

Independent pronouns function not unlike the independent pronouns of Spanish, i.e., they are usually omitted in speech, unless emphasis is desired. Thus, in the example ʔi-wínuh *he stood up*, we may insert the independent pronoun ʔìʔ in front of the verbal base ʔi-wínuh thus: ʔìʔ i-wínuh *he stood up*, the third person category emphasized.

In this study independent pronouns will be omitted because they do not undergo inflection and are employed by native speakers only when emphasis is intended. They are not considered a part of the verb construction.

6. The verb theme may be divided into two types of verb stems: final and pre-final.

The verb theme always has a final stem and in addition may have zero, one, or several pre-final stems. A minimum verb theme consists of a zero pre-final verb stem and the final verb stem.

DIAGRAM OF A VERB CONSTRUCTION

Verbal Base			Tense-Modal Enclitic
Pronoun Complex	Verb Theme		
	Pre-final verb stem zero, one, or several	Final verb stem (always one)	(Expressed in the final verb stem)

The example used thus far in illustrating a verb construction: ʔi-wínuh *he stood up* is a minimum verb theme consisting of a zero pre-final verb stem and the final verb stem wínuh *stood up*. An example of a verb theme with a single pre-final stem is the following: ʔi-kà· -sogeh *he hid (himself)*. . . .kà· *hide*, represents the pre-final stem and sogeh *sat*, the final stem. For examples of verb themes with more than one pre-final verb stem the following are offered: ʔi-ʔan-tòh-pà· *he made shoes* (two pre-final verb stems) ʔi *he*; ʔan *foot*; tòh *container*; and pà· final verb stem, *made*; ʔi-páváh-sę̀· -p̣o-k̀ò· *he ate bread crumbs soaked in stew* (three pre-finals) ʔi *he*; páváh *bread*; sę̀· *boiled food*; p̣o(h) *liquid*; and k̀ò· final verb stem, *ate*; na-sòhpaveh-ṫô· -bâ· -kè· -xàn-pówah *he arrived from wood-splitting work in a lazily-exhausted manner* (six pre-final verb stems) na *he*; sòh *fire-wood*; paveh *split*; ṫô· *work*; bâ· *lazily*; kè· *strength*; xàn *exhausted*; and pówah final verb stem, *arrived*.

Tewa verb stems (pre-final or final) may be monosyllabic, disyllabic, or polysyllabic. More commonly, however, verb stems are monosyllabic.

7. Subsidiary elements not strictly the concern of this paper have been exposed in the analysis of the verb construction above; these elements are briefly and tentatively described below. The study of Tewa verb structure has not proceeded far enough to give a complete and adequate discussion of these elements at the present time.

Tense-modal enclitics are nearly always fused to the final verb stem; that is, they are morphemic and not phonetically distinct. These elements in Tewa promise to give insights into concepts of time, matter, duration, intensity and the like of a radically different nature from those common in the Western world. Because of these differences it would be unfair to equate English tense and mode concepts exactly with Tewa. A superficial comparison of Tewa concepts with others leads the writer to believe that a great deal of light might be thrown upon the reputed "unhistorical sense" of the Pueblo Indian by a comparative study of these elements in Pueblo languages. What Whorf[4] found with the Hopi in regard to differences in the concept of time from those in Western cultures, is certainly true of Tewa. How close Hopi concepts are to Tewa, or in general, how close the different pueblos are in regard to tense and mode concepts, can only be disclosed by further study. It is not improbable, however, that these elements of grammar mirror the puzzling differences in human behavior between groups and that a concentrated study may lead to an understanding of basic causes.

Tewa independent pronouns are like the English, I, you, he (she, it), we, you (pl.), and they. They function like the Spanish independent pronouns and are usually omitted in speech, unless emphasis is desired.

The pronoun complex is always prefixed to the verb theme and defines the construction in respect to subject-object relationship, persons, and number (singular, dual or plural). These prefixed pronouns comprise a class too numerous to list for the purposes of this paper. They are perhaps the most difficult of Tewa grammatical elements to explain and classify. By the selection of appropriate prefixed pronouns the speaker

[4] B. L. Whorf, Science and Linguistics. Technology Review 44. 229–248 (1940).

of Tewa is enabled to make subtle and complicated distinctions in defining subject-object relationships.

8. For simplicity of presentation in the foregoing classification of verb themes, only verb constructions of the third person, singular have been used. The paradigm is as yet undefined, but appears to mean past completive tense of perfective mode. Many more verb constructions than are listed under each category have been examined; however, it is believed that the following will be sufficient to establish validity of the classifications.

9. Verb constructions of a minimum verb theme, i.e., a zero pre-final verb stem.

Verbs with pre-fixed pronoun: ʔi. ʔi-ʔàn *he did*; ʔi-ʔaweh *he dressed*? ʔi-biⁱ *he turned*; ʔi-bun *he returned*; ʔi-ć*á*? *he severed it* (as with a knife); ʔi-ć*ì*n *he tied it* (as a knife in a cord); ʔi-ć*ú*reh *he brought it in*; ʔi-č*ą*· *he is pretentious*; ʔi-čuweh *he dyed it*; ʔi-č*á*· *he threw it away* (plural object); ʔi-dén *he spilled it*; ʔi-ʔè· *he threw* (*as of food to chorus of singers in a dance*); ʔi-ʔén *he vomited*; ʔi-ę̀· *he ran*; ʔi-fareh *he passed it*; ʔi-féreh *he offered a prayer*; ʔi-fèn *he farted* (*he broke wind*); ʔi-fì· *he smoked*; ʔi-ǯà· *he brought it up*; ʔi-ǯ*á*nuh *he turned over*; ʔi-ǯ*á*reh *he danced*; ʔi-ǯàwèh *he peeled it off*; ʔi-ǯè· *he joined it* (*as two threads*); ʔi-ǯ*ĭ*ǯeh *he walked*; ʔi-ǯ*ó*n *he ordered someone* (*to do something for him*); ʔi-h*á*nu̧h *he spent it*; ʔi-hén *he betted* (*took a bet*); ʔi-hè· *he killed*; ʔi-ho? *he took it* (*or carried it*); ʔi-hógeh *he picked took* (*several things*); ʔi-k*á*· *he caught up* (i.e. he understood after not understanding for a while); ʔi-kán *he brought it*; ʔi-kanu̧h *he felled it*; ʔi-ké? *he caught* (*it, one object*); ʔi-kìn *he yelled*; ʔi-kíreh *he sat it down*; ʔi-kò· *he planted* (*crops*); ʔi-ku· *he poured*; ʔi-kumɛh *he bought* (*it*); ʔi-kumu̧h *he covered it up*; ʔi-kúveh *he copulated*; ʔi-kʷiǯeh *he irrigated* (*it*); ʔi-k̀ò· *he ate* (*it*); ʔi-k̀úʰ? *he laid it* (*or he laid down*); ʔi-kʷóreh *he placed them* (*he laid them*); ʔi-mą̀· *he brought it*; ʔi-mégeh *he gave* (*it*); ʔi-mú? *he saw* (*it*); ʔi-nąn *he hit it*; ʔi-nànᶻúh *he destroyed it*; ʔi-nyą́? *he fought*; ʔi-ʔóreh *he let himself forget it*; ʔi-ʔowóǯeh *he forgave*; ʔi-ʔowíreh *he washed himself*; ʔi-ʔò· *he bathed*; ʔi-ʔo?k̀áveh *he chewed it* (*took a bite*); ʔi-paǯeh *he grew* (i.e., *corn*); ʔi-páveh *he chopped it* (*split*); ʔi-piǯeh *he took it out*; ʔi-píreh *he cleaned it*; ʔi-pà· *he made* (*it*); ʔi-p̀án *he spun* (as cotton or wool); ʔi-p̀ènu̧h *he sprained himself*; ʔi-p̀ę́reh *he took it off*; ʔi-p̀íreh *he filled it*; ʔi-sán *he defecated*; ʔi-sòʔǯòn *he urinated*; ʔi-sógeh *he sat down*; ʔi-sų̀ę̀h *he drank*; ʔi-sù· *he untied it*; ʔi-šà· *he found it*; ʔi-šà· *he arose*; ʔi-šùn *he flew*; ʔi-tę̀· *he stretched himself*; ʔi-té· *he chose*; ʔi-tégeh *he lifted it*; ʔi-tę̀hgeh *he touched it*; ʔi-tógeh *he put it in, on* (*placed it*); ʔi-tuǯeh *he lifted it up*; ʔi-t̀á⁴: *he ground* (e.g. *corn meal*); ʔi-t̀íreh *he closed it*; ʔi-θá⁴: *he broke it*; ʔi-θòn *he shot* (*as an arrow*) ʔi-ʔúgè· *he dived*; ʔi-wáreh *he blotted it out*; ʔi-wą́veh *he lowered it* (or *he lowered himself*); ʔi-wóǯéh *he threatened* (*it*); ʔi-wón *he rejoined* (*as a party, became a member*); ʔi-wóreh *he diverted the stream* (*or ditch of water*); ʔi-xáveh *he shattered it* (*as a pot or glass, something that shatters*); ʔi-xo? *he carried it*; ʔi-xù· *he opened it*; ʔi-xùn *he bit* (*it*); ʔi-xʷaǯeh *he dropped or dangled it*; ʔi-xʷę̀reh *he hit* (*or spanked*) *it*.

Verbs with prefixed pronoun: na. na-ą̂n *he thought*; na-ć*ú*h *he entered*; na-č̊ù· *he died*; na-cà·rì· *it became severed*; na-cì· *it has become fried* (*as with food*); na-cíndì. *it became tied*; na-eǯeh *she gave birth*; na-énurì· *he vomited* (*he became vomited*); na-ę̀· *he came*; na-fareh *he passed*; na-ǯà· *he ascended*; na-ǯ*á*h *he ran away*; na-hán *it ended* (*became exhausted*); na-kanuh *he fell*; na-mę̀· *he went*; na-nî· *he was caught* (*as in a trap*); na-ʔo·ǯ*ĭ*· *he froze*; na-p̀â· *it exploded*; na-perì· *he lost*; na-pì· *he went out* (*he emerged*); na-pó⁶· *he* (*it*) *became*; na-powah *he arrived*; na-t̀à· *he thinned, became thin*; na-t̀ò· *he heard*; na-túh *he said*; na-θaʔrì· *it broke*; na-ʔúgè·rì· *he was drowned*; na-wą́h *he descended*.

Verbs with prefixed pronoun: ʔó·. ʔó·-àn *it was done to him*; ʔó·-biⁱ *he was turned*

around; ʔó·-bùn *he was returned*; ʔó·-ɛ̨ę̀nu̧h *he was thrown* (*as a ball*) ʔó·-ʔè· *he was juggled*; ʔò·-ę̀nʸùh *he was painted*; ʔó-fen *wind was broken on him* (*as if by the scent of a skunk*); ʔó·-fî· *he was smoked* (*as in a ceremonial by blowing smoke in his face*); ʔó·-ʒà· *he was brought up* (*into a room*); ʔó·-ʒè· *he was met*; ʔó·-ká·[4] *he was overtaken* (*as in a race*); ʔó·-kanuh *he was thrown* (*felled, tripped*); ʔó·-kán *he was brought*; ʔó·-ké? *he was caught*; ʔó·-kúveh *he was seduced*; ʔó·-k̀ò· *he was eaten*; ʔó·-kú? *he was laid down*; ʔó·kʷì· *it was taken away from him* (*he was deprived*); ʔó·-mà· *he was brought*; ʔó·-megeh *he was given*; ʔó-mú? *he was seen*; ʔó·-ʔowíreh *he was washed*; ʔó·-ʔò· *he was bathed*; ʔó·-p̨égeh *he was abandoned*; ʔó·-p̨ɛ́reh *he was stripped*; ʔó·-piʒeh *he was taken out*; ʔó·-sógeh *he was seated*; ʔó·-šà· *he was found*; ʔó·-tɛ̨· *he was pulled* (*stretched*); ʔó·-tegeh *he was lifted*; ʔó-ṫá·[4] *he was ground*; ʔó-ṫè· *he was hated*; ʔó·-xo? *he was taken*; ʔó·-xʷɛ̨reh *he was whipped*.

Verbs with pre-fixed pronoun: ʔôn. ʔôn-ʔàn *it was given to him*; ʔôn-den *it was spilled for him*; ʔôn-fereh *it was blown away for him* (i.e. *as a cap by the wind*); ʔôn-kan *it was brought for him*; ʔôn-ke? *it was caught for him*; ʔôn-mà· *it was brought for him*; ʔôn-pà *it was made for him*; ʔôn-pireh *it was cleaned for him*; ʔôn-píreh *it was filled for him*; ʔôn-sogeh *it was sat down for him*; ʔǫ̂n-tà· *his* (*what belongs to him*) *are known* (*by others*); ʔôn-té· *it was chosen for him*; ʔôn-θá· *it was broken for him*; ʔôn-ʒè· *it was joined for him*; ʔôn-xʷɛreh *his* (*what belongs to him*) *was spanked*.

Verbs with pre-fixed pronoun: ʔûn. ʔûn-ʔɛn *he has one* (*or it*) [*it sits for him*]; ʔûn-kè· *his* (*what belongs to him*) *is strong*; ʔon-kírih *it was placed for him*; ʔûn-k̀ó·[6] *he has one* (*or it*) [*it lies for him*]; ʔûn-ʔóreh *he forgot*; ʔûn-pà? *it burst for him*; ʔûn-pà· *it grew for him*; ʔûn-perì· *his* (*what belongs to him*) *lost*; ʔûn-pì· *it went out for him*; ʔûn-pó·[6] *it happened to him*; ʔûn-pówah *it arrived for him*; ʔún-pâ· *it exploded for him*; ʔûn-té· *it lacks for him*; ʔûn-ṫè· *his* (*what belongs to him*) *is angry*; ʔûn-ʒà· *it arrived for him* (i.e. *a visitor came to call*).

10. Verb constructions containing one pre-final verb stem.

Verbs with prefixed pronoun: ʔi. ʔi-ʔà·-ʔàn *he swept*; ʔi-ʔanʸîngî-ʔàn *he took care of it* (*or himself*); ʔi-ʔân-p̨enuh *he sprained his foot*; ʔi-ʔân-tegeh *he lifted his foot*; ʔi-ʔą̀ʔ-p̨ɛ́reh *he undressed*; ʔi-ʔáʔrâ·-ʔàn *he played*; ʔi-ʔąh-tuʒeh *he stepped forward*; ʔi-ʔą·gen-suwɛh *he drank gruel*; ʔi-a·-sù· *he spread his blanket open* (*to expose himself*); ʔi-baʔáʔàn *he put on a belt*; ʔi-baʔá-pà· *he made a belt* (or belts); ʔ-ibè·-k̀ò· *he ate an apple or apples*; ʔi-bí·-kíreh *he turned around and stood watching*; ʔi-ɛ̀è·-ʔàn *he made a face*; ʔi-cíh-kíreh *he peeped out*; ʔi-cí-xa-k̀ú? *he laid down to wait*; ʔi-den-k̀ú? *he laid away* (*for safe keeping*); ʔi-den-màn *he saved it*; ʔi-ʔéhéʔ-ʔàn *he put on war* (*or dance*) *paraphernalia*; ʔi-fà·-ʔàn *he made fire*; ʔi-hó?-nʸą́? *he married*; ʔi-hú·nʸan *he ate a meal*; ʔi-hú·-pà· *he made* (*cooked*) *a meal*; ʔi-ko-ʔàn *he lighted it*; ʔi-ʔí-sogeh *he straddled it*; ʔi-ʔí-ʔan *he burdened himself*; ʔi-kà·-kú? *he hid himself* (*or something*); ʔi-kà·-sógeh *he hid it or himself*; ʔi-kà·-wínuh *he hid upright*; ʔi-koʔ-xo? *he went to bathe*; ʔi-koh-sè· *he swam*; ʔi-kumɛ-ɛ̀à· *he sold it at an extremely low price*; ʔi-kumuxo? *he carried it covered*, or, *he went along covered e.g. slicker or blanket over his head*; ʔi-kʷąh-xʷɛ́reh *he shot* (*e.g. shot a rifle*); ʔi-mà·-pà· *he counted*; ʔi-màn-ɛ̀à? *he cut his hand*; ʔi-ʔo-wíreh *he washed himself*, or, *he washed it*; ʔi-ʔowózɛ-mɛgeh *he gave forgiveness* (*he forgave*); ʔi-pává-ʔàn *he baked* (*made*) *bread*; ʔi-píví-k̀ò· *he ate meat*; ʔi-p̨áhkà· *he laughed*; ʔi-p̨â·-kin *he shouted with laughter*; ʔi-p̨ò·-ʔàn *he wetted himself* (*got wet by neglect as if by rain or falling into a river*); ʔi-p̨oh-kʷiʒeh *he threw things in the river* (*to be carried by the current*); ʔi-p̨ón-nàn *he nodded his head*; ʔi-p̨ò·-sùwɛ̨̀h *he drank water*; ʔi-sí·ⁱ·-sogeh *he sat down to cry* (or, *he sat himself to cry*); ʔi-síh-tɛ̨· *he cried out*; ʔi-soh-paveh *he split wood*; ʔi-šu̧wɛ́-sén *he blew his nose*; ʔi-tah-

tógeh *he placed himself to grind (e.g. corn)*; ʔi-tó-ʔàn *he put on a shirt*; ʔi-tóʔ-p̣éreh *he took off his shirt*; ʔi-tóh-sógeh *he placed himself in a small enclosure*; ʔi-tu-wínuh *he yelled* or *he shouted*; ʔi-tun-bí˙ *he turned around to speak*; ʔi-tun-k̄úʔ *he laid down to talk*; ʔi-tun-nàn *he read*; ʔi-tùn-sogeh *he sat down to read*; ʔi-ṯô·-nʸàn *he listened*; ʔi-ṯô·-pà· *he made hardwork of it* (or *he provided employment*); ʔi-weʔge-ʔàn *he gathered* (*he arranged a meeting or conference*); ʔi-xaʔ-ʔàn *he guarded* (*he stood watch*); ʔi-xaʔ-pà· he *made songs or a song*; ʔi-xaʔ-wàn *he sang a song*; ʔi-xɛgeʔ-nàn *he helped*; ʔi-xèn-bun *he returned to attack*; ʔi-xun-kíreh *he took a biting grip* (*he took a grip with his teeth*); ʔi-ǯò·-ʔàn *he left it alone* (*he ignored it*); ʔi-ǯóʔ-k̄úʔ *he went to bed* (*he laid down to go to sleep*); ʔi-ǯóh-sógeh *he sat down to sleep*.

Verbs with pre-fixed pronoun: na. na-bâ·-kanuh *he fell from laziness*; na-ćè·-pó·⁶· *he got an expression on his face*; na-cí·-mù· *he has an expression in his eyes*; ne-daʔ-pó·⁶· *he asked for it*; na-ʔè·ǯè·-mę̀· *he went to meet him* (*or them*); na-hą̀·-pó·⁶· *he became poor* (*poverty stricken*); na-hąse-pó·⁶· *he became hungry*; na-hê·-ʔę̀· *he came prepared*; na-hè·-kanuh *he fell from illness*; na-hè·-pó·⁶· *he became sick* (*he was stirred with sympathy*); na-hén-mę̀· *he went to war*; na-kà·-·pó·⁶· *he disappeared*; na-kè -hán *he tired* (*he got tired*); na-ko-ǯeh *it burned*; na-kʷiǯe-mę̀· *he went to irrigate*; na-màʔ-p̣ę́h *he escaped*; na-pahtô·-mę̀· *he went to herd* (i.e. *sheep*); na-pává-daʔ *he wants bread*; na-píʒe-pì· *he went out to borrow something*; na-p̣â-tu̧h *he emitted a laugh*; na-p̣oh-ké· *he is backward* (*feeble minded*); na-p̣ò·sáʔà· *he is thirsty*; na-p̣ó·-pó·⁶ *he became wet* (*as from rain*); na-šave-pì· *he fled*; na-sì-hè· *he has a stomach ache*; na-sí˙·-mę̀· *he went away crying*; na-ṯàn-pó·⁶· *he won*; na-ṯè·-pì· *he went out angry*; na-ṯè·-pó·⁶· *he became angry*; na-ṯô·-daʔ *he wants work*; na-ṯô·-perl· *he lost a job* (*position*); na-tô·-pówáh *he came to work*; na-ʔų̇n-pì· *he bled*; na-wiǯeh-ʔén *he is separated*; na-xá·pó·⁶ *he became heavy*; na-xą·-tuh *he gave a snore*; na-xèn-wąh *he swooped down to attack*; na-xų̇·pó·⁶· *it became dark*; na-ǯéngi-pó·⁶· *he* become proud; na-ǯó-sa-ʔò· *he awakened* (*he* became awake).

Verbs with prefixed pronoun: ʔó·. ʔó·-ʔą̀-ćáreh *he was kicked*; ʔó·-ʔà-p̣ereh *he was stripped of his clothing*; ʔó·-ʔaʔrà·-píǯeh *he was taken out to play*; ʔó·-ciʔ-an *he was made to walk*; ʔó·-héh-piǯeh *he was expelled*; ʔó·-hén-hoʔ *he was taken to war*; ʔó·-hi-ʔan *he likes it*; ʔó·-kè·-hanuh *he was exhausted*; ʔó·-kʷą-xʷereh *he was shot*; ó·-mah-pú· *he was hit* (*as if by a fist*); ʔó·-maʔ-p̣ereh *he was released*; ó·-pan-keʔ *he was taken prisoner*; ʔó·-píǯeh-mɛgeh *he was loaned* (*an object or objects*); ʔó·-p̣o-hè· *he was drowned*; ʔó·-p̣ò-hoʔ *he was carried away in the current of a stream*; ʔó·-p̣òh-ûngè· *he was drowned in water*; ʔó·-toh-sogeh *he was placed in an enclosed area* (i.e. *he was put in jail*); ʔó·-ṯeʔ-nʸan *he was scolded*; ʔó·-tuh-čɛnuh *he was cursed*; ʔó·-ǯò·-an *he was left alone* (*neglected*);

Verbs with prefixed pronoun: ʔôn. ʔôn-bè·-kan *fruit was brought to him*; ʔôn-foréh-kíreh *a door was constructed for him* (*a path of light*; i.e., *he was made to understand*); ʔôn-hú·-hoʔ *food was taken to him*; ʔôn-maʔkén-nàn *something was placed in the palm of his hands*; ʔôn-nava-kwíǯeh *his fields were irrigated for him*; ʔôn-pavah-pà· *bread was made for him*; ʔôn-pę́-hè· *deer was killed for him*; ʔôn-píví-kan *meat was brought to him*; ʔôn-p̣oh-keʔ *something belonging to him was caught in a current of the stream*; ʔô-p̣ò·-ṯireh *his water* (*urine*) *was shut off*; ʔôn-soh-paveh *wood was cut for him*; ʔôn-ṯeh-p̣íreh *trouble was made for him*; ʔônxaʔ-pá· *a song was made for him*; ʔôn-xaʔ-wan *a song was sung for him*; ʔôn-xèn-kan *flour was brought to him*; ʔôn-xún-ṯâ· *his corn was ground for him*; ʔôn-xʷiʔ-sogeh *something* (*an object as a medal*) *was hung on him*;

Verbs with prefixed pronoun: ʔûn. ʔûn-cįn-ʔoreh *he forgot to walk*; ʔûn-hàngìn-pó·⁶· *he found out*; ʔûn-hén-perih *his* (*something belonging to him*) *lost a contest*; ʔûn-hiʔ-pó·⁶ *he had fun* (*he enjoyed himself*); ʔûn-kà·-k̄ò· *he has it hidden*; ʔûn-kà·-pó·⁶· *it disappeared* for him; ʔûn-kì·-pó·⁶· *he understood*; ʔûn-p̣â-

hán *he stopped laughing*; ʔûn-ṗeri-mu· *his* (e.g. *his child*) *is spoiled*; ʔûn-xʷi-ʔèn *something is tied and waiting for him* (i.e. *a horse outside the house hitched to a post*); ʔû-xų̀·-pó·ˀ· *he became angry*; ʔû-ǯóʔ-ǩó·ˀ· *his* (*something to him*) *lay sleeping* (e.g. *his child*).

11. Verb constructions containing two pre-final verb stems.

Verbs with prefixed pronoun ʔi. ʔi-ʔa-kuʔ-cê· *he sold bows*; ʔi-ʔàn-toh-ʔàn *he put on shoes*; ʔi-ʔàn-toh-píreh *he cleaned shoes*; ʔi-bâ-ṫô·-ʔàn *he worked in a lazy manner*; ʔi-bondo·-hí·-ʔàn *he spoke in a crazy manner*; ʔi-buwa-ǩara-ǩò· *he ate piki bread*; ʔi-buʔ-xʷà·-hoʔ *he dragged himself to town*; ʔi-ćè·mah-xwę̀· *he scratched his face*; ʔi-ćè·-man-ʔowíreh *he washed his face and hands*; ʔi-cígo-wɛnu-ʔàn *it lightninged* (i.e. *there was a flash of lightening*); ʔi-cí-xa-ʔàn *he waited*; ʔi-fa-ko-ʔan *he snapped the fire lights*; ʔi-fóʔ-beǯe-ʔàn *it snowed* (*in little pellets*); ʔi-fóh-xʷèn-sù· *he loosened his braid of hair*; ʔi-fóh-mah-xʷì· *he brushed his hair*; ʔi-kʷą-xʷǵreh-keʔ *he secured a rifle*; ʔi-kʷąh-tą-ʔàn *it thundered*; ʔi-kʷàn-wą̀-ʔàn *it rained and the wind blew*; ʔi-kwí·-baʔah-pà· *he made women's belts*; ʔi-màn-xų-dàweh *he arched his finger*; ʔi-maʔkén-piǯeh *he took it out cupped in his hands*; ʔi-man-ku-cę̀· *he struck his hand* (*as with a rock*); ʔi-màn-mú·pèn *he sewed gloves*; ʔi-màn-ʔo-wíreh *he washed his hands*; ʔi-man-xų-θá· *he broke his finger*; ʔi-pava-xòh-togeh *he put bread to bake*; ʔi-pán-sè-pà· *he made bread pudding*; ʔi-pę̀h-šareh-ǯareh *he danced the deer dance*; ʔi-pín-nan-keʔ *he secured wisdom*; ʔi-pin-nan-tà· *he knows magic*; ʔi-píví-ǩuh-cę̀· *he pounded meat* (i.e. "*jerky*") ʔi-píví-sę̀·-pà· *he made meat stew*; ʔi-púwageh-ʔąn *he put on his breech clout*; ʔi-púwageh-tegeh *he lifted his breech clout*; ʔi-ṗâ·ćè·ʔàn *he smiled*; ʔi-ṗâ-tu-wínuh *he burst out in laughter*; ʔi-ṗìn-ǩúwa-ǯareh *he danced the mountain sheep dance*; ʔi-ṗò·-saʔà-ʔàn *he made himself thirsty*; ʔi-ṗò·-suwę-ǩuʔ *he laid down to drink water*; ʔi-ṗò·-suwę-wąveh *he descended to drink water*; ʔi-ṗóxɛn-nan *he put on a hat*; ʔi-ṗóh-kumu-sogeh *he sat down with his head covered up*; ʔi-ṗò·-xʷa-hógeh *he drew water*; ʔi-sę̨́we-ku-ča *he sold pottery*; ʔi-sę̀·-ṗoh-suwɛh *he drank soup*; ʔi-sih-máh-sún *he massaged his stomach*; ʔi-sòh-paveh-mà· *he brought split fire wood*; ʔi-so-ṗo-hén *he spat*; ʔi-θa-θa-ʔàn *he shook himself*; ʔi-texʷa-mà·-pà· *he counted houses*; ʔi-ṫè·hén-togeh *he went into the war in anger*; ʔi-ṫè·-xún-kíreh *he took a grip of anger*; ʔi-tun-bí·-kíreh *he turned around and spoke*; ʔi-xo-cą·-winuh *he elected* (*proposed*) *himself eligible for marriage*; ʔi-ǯenekí-ćè·-ʔàn *he made an evil face* (*an expression indicating evil intent*).

Verbs with pre-fixed pronoun: na. na-ʔanšà·-pó·ˀ· *he thought*; na-cí·-hè-pó·ˀ· *he developed an eye sore*; na-cíʔ-ṫà-pó·ˀ· *he became blind*; na-dè·-tuwę-mè· *he went to look for coyote*; na-ʔę̀·-ṫan-pó·ˀ· *he won a race*; na-fa-ko-pó·ˀ· *it became illuminated with fire*; na-hén-ṫan-pó·ˀ· *he won a battle*; na-hoh-cą·ʔèn *he is married*; na-kè·-han-pó·ˀ· *he became exhausted*; na-kè·-han-pówah *he arrived exhausted*; na-koh-se·-mę̀· *he went swimming*; na-kùmɛ-daʔ-pó·ˀ· *he asked to buy it*; na-ke-fo-hè· *he has a sore-throat*; na-kʷą-xʷę́reh-ṫò· *he heard the report of a rifle*; na-kʷán-θòn-pì· *he went out to shoot jack rabbits* (*with bow and arrow*); na-ʔoṫì·-hè·-pó·ˀ· *he developed an illness from a cold*; na-ʔoǯeh-hè·-pó·ˀ· *de developed an ear ache*; na-ʔoǯeh-ṫà·-pó·ˀ· *he became deaf*; na-paʔrêboà·-pó·ˀ· *he felt sorry for his older sibling*; na-pę̀·-wo-pì· *he went out to hunt deer*; na-píví-píǯeh-mè· *he went to borrow meat*; na-pòh-kén-pí· *he went out to draw water*; na-pùwę-daʔpó·ˀ· *he asked to see it*; na-ṗâ·-ćè·-pó·ˀ· *he got a smile on his face*; na-ṗâ·-ʔè·ǯè·-mę̀ *he went out to meet him* (*or them*) *with a smile*; na-ṗâ·-tun-ʔèn *he is sitted and telling jokes*; naṗâ·-wa·-pówah *he arrived bursting with laughter*; na-ṗó-hè·-pó·ˀ· *he had a headache*; na-ṗò·-saʔà·-pó·ˀ· *he became thirsty*; na-ṗoh-kê·-mù· *he is thick skulled* (i.e. *he does not learn rapidly*); na-ṗò-ókare-pó·ˀ· *he took cold from exposure to rain*; na-šareh-ṫan-pó·ˀ· *he won the dance* (i.e. *a dance contest*); na-saveh-hén-mę̀· *he went to*

war against the Apache; na-seh-kaneh-pó·$^{ó·}$ *he exhibited affection*; na-sę̀·poh-da? *he wants soup*; na-sì-hè·-pó·$^{ó·}$ *he developed a stomach ache*; na-sí·-wà·-pówah *he arrived crying*; na-so-foh-čah *he is a malicious gossiper*; na-sòh-paveh-pì· *he went out to split firewood*; na-θa-θa-pó·$^{ó·}$ *he trembled*; na-θî·-pi̯ǯeh-mè· *it has gone toward evening* (i.e. *it has become evening*); na-θírih-xù·-pó·$^{ó·}$ *it became evening dark*; na-tą̀-tun-ṫô· *he heard a noise*; na-ṫè·-xen-wąh *he swooped down with anger*; na-ṫe-ǯà·-pó·$^{ó·}$ *he became mad*; na-ṫô·-da?-pó·$^{ó·}$ *he asked for work*; na-ṫô·-hê·-pówah *he came ready to go to work*; na-ṫô·-kè·-han *he tired of work*; na-ṫô·-šave-pì· *he ran away from work*; na-xo·-hè·-pó·$^{ó·}$ *he developed a sore arm*; na-ǯoh-bondò·-pó·$^{ó·}$ *he was crazy with sleep*; na-ǯongeh-?ę̀·-pì· *he went out running in a lazy manner*; na-ǯoh-sa?ó· *he awakened*; na-ǯo-xąve-ǩó· *he is asleep*.

Verbs with prefixed pronoun: ?ó·. ?ó·-?ą?-p̣ereh-ku? *he was laid down naked*; ?ó·-?án-šà·-?àn *he was remembered*; ?ó·-?a?rà·-xe-pi̯ǯeh *he expelled as a prank*; ?ó·-ćè-ma-fawe *he was slapped*; ?ó·-cè?-p̣ó·$^{ó·}$-?àn *his face was bruised*; ?ó·-dè-pi-xè· *he was frightened by a coyote*; ?ó·-hén-bo·-do·-?àn *he was made crazy by the war*; ?ó·-hén-pàn-ke? *he was made a war prisoner*; ?ó·-keh-pi̯-xę̀· *he was made to fear bears* (*he was bear frightened*); ?ó-màn-xʷi-?àn *his hands were tied*; ?ó·-man-xʷi-p̣ereh *his hands were untied*; ?ó-pavah-pi̯ǯeh-mɐgeh *he loaned bread*; ?ó·-p̣o-sa?à-àn *he was made thirsty*; ?ó·-p̣ah-kà·-?àn *he was made to laugh*; ?ó·-p̣o·-suwę-?àn *he was permitted to drink*; ?ó·-p̣oh-kwi̯ǯeh-mà· *he was brought down the river as floating matter* (*flotsam*); ?ó·-pú-fo-ǯún *he was poked in the buttox*; ?ó·-se-kaneh-?àn *he was embraced*; ?ó·-so-foh-pèn *his mouth was sewed up* (i.e. *he was verbally defeated by a more able and forceful speaker*); ?ó·-ṫè·-ǯà·?àn *he was made angry*; ?ó·-wo·-da-?ą*n he was embarrassed*; ?ó·-xò·-toh-?àn *leggings were put on him*; ?ó·-xu̯-mah-sún *his limbs were massaged*;

Verbs with prefixed pronoun: ?ôn. ?ôn-?ah-xêkàn *blankets were brought to him*; ?ôn-foh-xwɐn-fereh *his braids were blown by the wind*; ?ôn-foh-xʷćìn *his braids were tied for him*; ?ôn-ku-pì·$^{i.}$-kàn *coral was brought for him*; ?ôn-ma?-kén-nàn *it was placed in his hands*; ?ôn-?ówóǯeh-dà·-?àn *forgiveness was asked of him*; ?ôn-píví-xo-togeh *meat was put in to cook for him*; ?ôn-p̣ò·-xʷa-hoge *his water* (*urine*) *was removed* (i.e. *he was compelled to urinate*); ?ôn-p̣ô-ta?-nyàn *the proper road* (*or path*) *was pointed out to him*; ?ôn-xun-pavah-ǯà· *corn bread was brought up for him*.

Verbs with prefixed pronoun: ?ûn. ?ûn-man-tì·-pó·$^{ó·}$ *his hand became swollen*; ?ân-nàh-pà·-?oreh *he forgot to hoe* (e.g. *a garden patch*); ?ûn-pavah-fa-xàn *his bread burned for him*; ?ûn-p̣o-keh-ṫân *his* (*something belonging to him*) *fell into the water*; ?ûn-p̣oh-kén-pì· *his* (i.e. *someone for him*) *went out to bring water for him*; ûn-θa-θa-pó·$^{ó·}$ *it trembled for him*; ?ûn-tageh-kì·-pó·$^{ó·}$ *he learned the truth*; ?ûn-hén-ṫan-pó·$^{ó·}$ *war has terminated in a victory for him*; ?ûn-xʷi-mah-p̣eh *his* (i.e. *something belonging to him*, e.g. *a horse*) *became loose*.

12. Verb constructions containing three or more pre-final verb stems.

Three pre-final verb stems. Verbs with prefixed pronoun: ?i. ?i-?áh-kų̀-čah-mà· *he brought bows to sell*; ?i-?àn-toh-pah-sogeh *he put himself to the task of making shoes*; ?i-bú-pí̯ǯeh-cį-àn *he made a motion to go toward town*; ?i-fa-ko-ki·-ćureh *he illuminated the place with candle light*; ?i-fe-θínin-?à·ra-?àn *he played top*; ?i-fó-má-xʷì·-sogeh *he sat down to brush his haid*; ?i-foh-xʷɐn-xʷi-àn *he tied his hair in braids*; ?i-hén-cíxa-àn *he waited to battle*; ?i-hén-pín-nan-ke? *he secured war magic*; ?i-ko-fe-kų-čâ· *he sold canoes*; ?i-kʷą-xᵛɛreh-ṫô-nʸàn *he listened for the report of the rifle*; ?ókʷɛ-ku̯h-pĩxè· *he was frightened by Mexicans*; ?i-man-xų́-mah-xwè· *he scratched his fingers*; ?i-man-xų́-toh-?àn *he put on a ring*; ?i-owingeh-we?geh-tu-?àn *he called a meeting of the pueblo*; ?i-pàn-sè·-hê-àn *he prepared bread pudding*; ?i-pàn-sè·-xoh-kireh; *he put some bread pudding to cook*; ?i-pava-sę̀·poh-kàn *he brought bread and meat stew*; ?i-pu-wàgeh-mah-xʷí· *he brushed his trousers*;

ʔi-ṗâ-ćè·-hí·-ʔàn *he spoke with a smile on his face*; ʔi-sene?-tô·-in-kàn *he brought working men*; ʔi-sè·-ṗoh-suwɛh-sogeh *he sat down to drink soup*; ʔi-si-tę·-kanuh-ku? *he went to bed crying*; ʔi-sòh-paveh-tô·ʔàn *he worked splitting fire wood*; ʔi-šareh-ci-xa-wínuh *he stood to wait for the dancers*; ʔi-šareh-xa?-tô·nʸàn *he listened to dance songs*; ʔi-šareh-xò-toh-ʔàn *he put on dance leggings*; ʔi-so-vô·-só·-mɛgeh *he let his beard grow out*; ʔi-ṫè·-tun-hĭ·-ʔàn *he spoke with anger*; ʔi-ṫú·-tageh-hĭ·-ʔàn *he spoke while standing erect*; ʔi-wan-saveh-panhoge *he caught Navaho prisoners*; ʔi-xún-sè·-xòh-kíreh *he put corn to cook*; ʔi-ǯô-wà·-ṫô-ʔàn *he worked as if drugged with sleep*;

Verbs with prefixed pronoun: na. na-ʔàn-ʔę·-ṫan-pó·ᵒ· *he won the foot race*; na-cí-ǯo-píǯeh-mè· *he went to borrow a knife*; na-hén-ʔehe?e-da-ʔè· *he came to ask for war paraphernalia*; na-ko-feh-ʔę·-perih *he lost the boat race*; na-kų-ća-da-pó·ᵒ· *he asked to sell*; na-ke-weri-ṫô·-pĭ· *he went to work on horse back*; na-ku̇wa-šareh-hê-mù· *he is ready for the mountain sheep dance*; na-kʷę-ku-xà·-pó·ᵒ· *he became drunk like a Mexican*; na-kʷą-xʷęreh-da?-pó·ᵒ· *he asked for a rifle*; na-ké-fo-hè·-pó·ᵒ· *he developed a sore throat*; na-kù-xʷĭreh-wóh-pĭ· *he went sling-shot hunting*; na-nąn-θa-θa-pó·ᵒ· *there was an earth quake*; na-oxúwa-munu-munu-pó·ᵒ· *clouds rolled out (like smoke)*; na-ǫǯeh-fogéh-hè·-pó·ᵒ· *he had an ear ache*; na-pahtoh-tô·-tuwɛh-mè· *he went in search of sheperding work*; na-pahtoh-ṫô·-wi-powa *he returned from sheepherding*; na-pivi-ṫà·-da?-pó·ᵒ· *he asked for "jerky" meat*; na-píví-sè·-tuwę-mè· *he went in search of stew*; na-ṗoh-kén-pĭ·-mè· *he went out to fetch water*; na-só-foh-hè·-pó·ᵒ· *he developed sores inside his mouth*; na-soh-paveh-ṫô·-kè·-xan-powa *he arrived exhausted from chopping wood*; na-su-árih-da?-mè· *he went to ask for a bow and arrow*; na-ṫô·-kè·-xàn-pówah *he arrived exhausted from work*; na-wan-saveh-hén-mę· *he went to war against the Navaho*; na-ǯó·xą-tun-kò· *he lies asleep snoring*.

Verbs with prefixed pronoun: ʔó·. ʔó·-ʔątuǯeh-kàn-nàn *he was made to step forward*; ʔó·-bè-ṗoh-kwiǯeh-mà· *fruit was brought down the river as flotsam*; ʔ6·-ćè-ma-fawe-kanuh *he was slapped to the ground*; ʔó·-hén-hí?-hí-?àn *he liked to talk about the war* ʔó·-hę·pàn-híân *he liked beasts of burden (horses, oxen, etc.)*; ʔó·-kʷą-xwɛreh-piǯeh-mɛgeh *he was loaned a rifle*; ʔó·-nah-pa-ṫô·-winuh *he was made to cultivate a field*; ʔó·pę̀h-šareh-hê-àn *he was made prepared for the deer dance*; ʔó·-pu-fo-ma?-ćè· *he was pinched in the buttox*; ʔó·-tun-kan-hi-?àn *he likes to read*; ʔó·-xo-cą-ǯi?a-té· *she was chosen the marriage witness ("the marriage mother")*.

Verbs with prefixed pronoun: ʔôn. ʔôn-cí-ǯoh-ké?wàn *his knife was sharpened for him*; ʔôn-pavah-mah-kén-nàn *bread was placed in his hands*; ʔôn-pìn-bè·-povi-kàn *plum blossoms were brought to him*; ʔôn-ṗô·-tà·-ta-ku? *the path was sketched for him*; ʔôn-sa-wo-ninnʸun-šà· *beautiful dance partners were found for him*; ʔôn-sęę̀weh-ṫô·-kanin-mà· *pottery makers were brought to him*; ʔôn-so-foh-ṫeh-píreh *he was given verbal trouble* (i.e. *he had difficulty defending himself in an argument*); ʔôn-šareh-xa?kì·-nʸàn *dance songs were taught to him*;

Verbs with prefixed pronoun: ʔûn-buwa-kara-ciwe-kò· *he has a piece of piki bread frying on the oven*; ʔûn-nah-pà·-ṫô·-keweh *his cultivation job is done*; ʔûn-pà·-ṫowa-xąwah-oreh *he forgot his society name*; ʔûn-ṗo-suwa-xoh-čah *water is being heated for him*; ʔûn-xún-nah-pah-sà· *his corn was cultivated*.

Four pre-final verb stems. Verbs with prefixed pronoun: ʔó·. ʔó·-bè·-xó·-ṗòh-kwiǯeh-mà· *branches of fruit were brought down to river as flotsam*; ʔó·-hè·-pàn-púwɛ-hí-ąn *he liked to see good beasts of burden (horses, oxen, etc.)*; ʔó·-kʷą-xʷɛreh-pireh-hi-àn *he likes to clean his rifle*.

Verbs with prefixed pronoun: ʔi. ʔi-fó-xwèn-su-ṫô-togeh *he applied himself to the task of loosening his hair*; ʔi-pu-fo-ma?-ćè·-kirih *he took a firm pinching grip in the buttox*.

Verbs with prefixed pronoun: na. na-cąwą-

ṗíreh-pa?-ƙewe-ƙó· *he lay in bed with a fever*; na-kʷą-xʷɛreh-tą-tun-ṫô· *he heard the sound of a rifle.*

Verbs with prefixed pronouns: ?ôn, and ?ûn. ?ôn-xén-tu-kán-tànin-ǯà· *a letter calling him into the war was brought to him*; ?ûn-pę̀·-pivi sè·-xo-čah *he has deer meat stew-cooking.*

Five pre-final verb stems. Verbs with prefixed pronouns: ?i, and na. ?i-hiwoh-pi?-hen-pin-nan-ke? *he secured bad war magic*; na-cì-ǯoh-pàh-?a?ra-ṫan-pó·ᵒ· *he won the knive game*; na-an-toh-kų-ča-da-pó·ᵒ· *he wanted to sell shoes.*

Six pre-final verb stem example: ?i-texʷa-na-ṗo-téhpa-ṫô-?ìn-kán *he brought adobe brick layers.*

DID THE YAHGAN INDIANS OF TIERRA DEL FUEGO SPEAK AN ESKIMO TONGUE?

DIAMOND JENNESS

OTTAWA, CANADA

0. Introduction
1. Yahgan phonology
2. Grammar
3. Vocabulary

0. Last September a friend lent me, while I was laid up in hospital, the recently-published autobiography of E. Lucas Bridges, Uttermost Part of the Earth. Lucas Bridges was born and brought up among the Yahgan Indians of Tierra del Fuego, whose language he evidently spoke quite fluently. As I read his book, dispassionately, I was struck by the number of native words (most of them place names or personal names) that possessed a strong Eskimo flavour. The very name of his birth-place, Ushuaia, sounded Eskimo (ushuk is a familiar Eskimo noun, and ayak a common noun-suffix); and the expression paiakoala *people of the paiak or beach*, recalled the name of the Point Hope Eskimos of Alaska, tikeragmiut *people of the tikerak or point*.

As soon as I left the hospital, therefore, I consulted the works of Bridges' father, the first missionary in the region, who had translated into Yahgan part of the New Testament, published an article on Yahgan grammar, and compiled an extensive dictionary which was printed in Austria later by F. Hestermann. The following observations are based on a brief examination of the grammar and dictionary.[1]

[1] Thomas Bridges: Yamana-English Dictionary, edited by Dr. Ferdinand Hestermann and Dr. Martin Gusinde, Mödling, 1933; and T. Bridges: A few Notes on the Structure of Yahgan, Journal of the Royal Anthropological Institute, Vol. XXIII, 1894, pp. 53–80. I am indebted to Dr. Henry Collins for securing me the loan of the dictionary from the library of the Smithsonian Institution.

1. Yahgan appears to contain no sounds, or almost none, that are not present also in one or other of the Eskimo dialects of Alaska. Like the more southern of these dialects, it tends to use affricatives rather than stops: e.g. it lacks the velar k universal from Bering Strait to Greenland, though the corresponding affricative, the ch of German ach, is extremely common. It also combines consonants like sh and g which most Eskimo dialects separate by a vowel. Yet it resembles Eskimo in never glottalizing its consonants, and in rejecting harsh combinations like tn and mshk which are so common in Indian languages, including that of the Ona who were the Yahgan's next-door neighbours.

2. In Yahgan, as in Eskimo, substantives and verbs, the principal parts of speech, tend to merge into one another. Pronouns are declined like nouns, and numerous suffixes attached to substantives and verbs supply the place of adjectives, adverbs and prepositions. The few real adjectives appear to be merely the word stems without their verbal or nominal endings. Bridges lists a number of adverbs and prepositions indicating place or direction, but these are plainly substantives and often declined as substantives. Thus ushpan *last, behind*, is simply the noun ushpa *lower part of the back*, with the suffix n. In all these respects Yahgan resembles Eskimo. The Eskimo word for *behind*, for example, is tunuani, the locative case of the noun tunua *its back*.

There is no gender in Eskimo, but nouns are inflected for person, number and case. Yahgan too has no gender, and inflects for number and case; but for person it uses a personal pronoun before the noun instead of a suffix after it. Thus whereas Eskimo says

nuliaga *my wife*, where it is the suffix ga that signifies *my*, Yahgan says haua *my*, tukum *wife*. It may be worth noting that in this respect it agrees not only with English, but with the language of the neighbouring Ona Indians.

Yahgan, like Eskimo, recognizes three numbers, singular, dual and plural, indicated by suffixes which in Eskimo, and perhaps also in Yahgan, are modified according to case. The unmodified Yahgan suffixes appear to be pai (dual) and ndaian or simply an (plural); the corresponding ones in Eskimo are k (dual) and t (plural).

The two languages show a rather closer parallelism in case. Bridges, misled probably by English grammar, says that Yahgan has three cases, a nominative, a possessive and an objective; but Hestermann, who published his dictionary, showed that this was an over-simplification. Hestermann himself distinguishes, at least in pronouns, two nominative forms, which he calls 'absolut' and 'conjunkt' (thus *I say* can be either hai kutana or ha kutan); but he found it difficult to explain why in some cases the nominative form seemed to be the same as the possessive. Here we can gain a clue, perhaps, from Eskimo, which has two nominative forms, an absolutive and a relative, the former used with intransitive verbs, and the relative, which is identical with the possessive or genitive, used with transitive verbs. Bridges' grammar seems to support the same distinction in Yahgan, for he lists hauanchi as being both the possessive and the objective form of the word for *this*. A close study of his translations from the New Testament might settle this question.

Eskimo has other cases besides the nominative and the possessive or genitive; and so also, apparently, has Yahgan. In Eskimo there are six, viz. a locative for place where, a terminalis for motion towards, a vialis for motion through, an ablative for motion from, a modalis to denote means or instrument, and a similaris to indicate likeness. In Yahgan there seems to be clear evidence for five of these cases, and possibly for all six. Consider the following, in which Yahgan forms will be indicated by Y. and Eskimo forms will be indicated by E:[2]

Locative, E. iglumi *in the house* (iglu), Y. akān (akar); terminalis, E. iglumun *to the house*, Y. akatūpai; ablative, E. iglumin *from the house*, Y. uralum *from the west* (ura); modalis, E. iglumik *with the house*, Y. auiāki *with a stone* (aui); similaris, E. iglutun *like a house*, Y. auiłaf *like a stone*; vialis, E. iglukun *through a house*, Y. urakun *in*(?) *the west*.

There can hardly be any doubt about the parallelism in the first five cases; but whether there is a vialis case in Yahgan is uncertain. Bridges gives the meaning *in* or *on* to the suffix kun which appears, not only in urakun above, but in five or six other words denoting direction; that is to say, he makes the suffix another locative, not a vialis.

Let us pass on now to the verbs. Here the resemblances are equally striking. Both languages make the same distinction between transitive and intransitive verbs, the former changing according to the person and number of both subject and object, the intransitive changing for subject only. Eskimo carries out the pattern more completely than Yahgan, which, in intransitive verbs at least, inflects for number in the third person only.

Like Eskimo, again, Yahgan inflects according to mood and tense, and its moods and tenses coincide very closely with Eskimo ones. What this means can be seen from Bridges' conjugation of the intransitive forms of the Yahgan verb for *give*. He lists the first, second and third person forms, singular, dual and plural, for the indicative mood; the interrogative mood (present, past and future); the imperative; the subjunctive,

[2] The Eskimo forms are taken from Jenness, D. *Eskimo Language*, Report of the Canadian Arctic Expedition 1913–1918, Vol. XV. To facilitate comparison, I have simplified the spellings of both Eskimo and Yahgan words without, I hope, mutilating either.

present and past (in Eskimo these are usually called subjunctive and conjunctive respectively); the negative form, and the participle. Eskimo has all these moods and tenses, although its inflections are different, and it uses suffixes only, whereas Yahgan in some cases has prefixes.

Besides conjugating an intransitive verb, Bridges gives half a dozen examples of transitive forms which indicate that they also differentiate according to mood and tense, just as they do in Eskimo. But how complicated this is becoming. You have one form for *I put it in*, another for *I put two things in*, a third for *I put more than two things in*; and so on for *thou puttest it in, thou puttest two things in, put two things in* (imperative), etc. Can chance alone have impelled both Eskimo and Yahgan to adopt this complicated system?

Let me add two parallels of a more detailed character. To express doubt, or our word *perhaps*, Yahgan inserts an affix -le between the pronominal subject and the verb proper; thus ha-le-la-kataka-a *I perhaps also will go*. At Barrow, Alaska, the Eskimos indicate doubt with the two syllables la and lu separated by the mood ending; thus qai-la-gama-lu *come perhaps I may*. You may say that this is a mere coincidence. But now compare the following Yahgan verb forms with the corresponding forms in the Eskimo dialect of Barrow:

Y. ikīmūpikina *he will put in the two things*, E. ikipagik; Y. igīmumisiū[3] *they (pl.) put in the things*, E. ikiumisigit *if they put in the things* (subj. mood); Y. kūtānamisiū-de[3] *they (pl.) have said*, E. oqautamisigit *when they told him* (conjunctive mood). Is it also a coincidence that these forms should resemble one another in stems, in endings and in meanings?

[3] Hestermann, from whom these Yahgan forms are taken (IJAL 5.167, 1929), thinks that we have here a "trial" number, making four numbers in verbs, though there are only three in nouns. I wonder, however, whether his "trial" is not like the Eskimo 3rd person reflexive, which has a rather similar ending and is used in subordinate clauses when the subject is the same as in the principal clause.

3. Parallels in vocabulary seemed less obvious than parallels in grammer, yet they too appeared more numerous than should result from pure chance. Here are some examples. If a few of them seem of doubtful validity, they should be weighed against others that suggest a certain regularity.

Y. kanna *who*, E. kina; Y. kainna *whose*, E. kia; Y. kīsi *summer*, E. kiak *hot weather*; Y. ka (prefix meaning *up*), kāgaia *to go, come, get up*; E. qā *top, surface*, qāgitka *he lays it on top*, qākittoq *he reaches the summit*. Y. kāla *bucket, pail*, E. qallun *dipper, ladle*; Y. kāta *come*, E. qairoq *he comes*; Y. kāmaim *arm of man, wing of bird*, E. qavoq *upper arm*; Y. kulaka *hip*, E. qussiq *hip*; Y. gūta *crack, hole*, E. qopaq *crack, fissure*; Y. gālia *abdomen*, E. qalasiq *navel*; Y. kūpaiasha *eastern shore*, E. qava *east*.

In the following words Yahgan initial h seems to correspond to Eskimo initial k or q:

Y. hasha *voice*, E. qati; Y. hāni *north wind*, E. qanangnaq; Y. hāg-un *egg*, E. qayangngox (Nunivak Is.); Y. hūta *neck*, E. qutuk *collarbone*, qungasiq *neck*; Y. hal-i-chin *axe*, E. qałqavaq; Y. hāta(n) *loose, as stone in wall*, E. qasutka *he loosens it*; Y. hosh-kona *to drip on*, E. kisiq *drop*.

In the following words Yahgan initial w seems to correspond to Eskimo initial k or q:

Y. wakur *urine*, E, qoiq; Y. wam *louse*, E. komak; Y. wāgun *up, over*, E. qā *top, surface*; Y. wanū-ma *swan*, E. qugruk *swan*, or kangoq *snow-goose*; Y. wulat(a) *to untie a knot*, E. qiliqtoq *it is tied*.

In the following Yahgan h may correspond to Eskimo s:

Y. hinnakan *brink; edge of sea*, E. sena *the edge of anything*, Y. hannū-ka *shoreward*, E. samma *down there*, sanmun *seaward*; Y. hakīla *ice*, E. siku.

In the following Yahgan ush may correspond to Eskimo is or it:

Y. ushkū *smoke, steam*, E. isiq *smoke*; Y.

ushkuf *extremity, end*, E. isuk *end*; Y. ushkush-ū *heel of foot*, E. isigaq *foot*; Y. ushpa *rump*, E. itiq *rectum*.

Other parallels are:

Y. yash *hand*, E. ajgaq; Y. tūunna *tracks, footprints*, E. tumi *track, trail*; Y. tūn-un *tooth, tusk*, E. tuloriaq *canine tooth*; Y. pūta *hole, hollow, valley*, E. putu *hole*; Y. dau-uka *shoulder-blade*, E. tui *shoulder, shoulder-blade*; Y. chilla *again*, E. suli; Y. chīpi *whetstone*, E. sillin; Y. ūlamb-īna *to touch with tongue*, E. ulu *tongue*; Y. ūa *man*, E. yuk, inuk; Y. auan *unlike, different*, E. ałła different, another; Y. ārin-a *springtime*, E. auraq *summer*; Y. ūarā-ku *twilight*, E. uvdlaq *morning*; Y. shikan *legs below knee*, E. sitqoq *knee*; Y. shaiina *warm*, E. salaroq *he suffers from the heat*; Y. āmāsiū *to skin, flay*, E. amiq *a skin*; Y. lūpan-oana *to blow*, E. supiga *he blows it*; Y. ingga *over there in the north*, E. ika, inga *over there*, ikarnaq *a north wind*; Y. sima *fresh water*, E. imiq.

I must confess that the correspondences in vocabulary are not by any means as close or as numerous as I had hoped to find them, considering the marked similarities in grammar. Yet, if Yahgan really is related to Eskimo genetically, as I suspect, or had borrowed from that tongue, its speakers must surely have severed all contacts with their linguistic kindred for at least as long as the Aleuts, that is to say, for at least 3000 years and probably longer. And when we reflect on the remoteness of Tierra del Fuego, and the manifold influences of every kind to which its inhabitants must have been subjected before they reached that isolated region, we should not expect their speech to preserve much outward resemblance to that spoken in an equally remote region on the other side of the globe. I myself feel that there are enough resemblances, even in vocabulary, to support the theory of some relationship between Yahgan and Eskimo; and I look forward to seeing that relationship confirmed by further researches into the structure of the Yahgan tongue. Until now it has been accounted a linguistic family distinct from all others. Consequently, if a relationship with Eskimo is confirmed, ethnologists will be faced with a most fascinating problem of diffusion.

COOS-TAKELMA-PENUTIAN COMPARISONS

EDWARD SAPIR† AND MORRIS SWADESH

1. Introduction
1.1. Date of manuscript
1.2. Description
1.3. Phonology
1.4. Why withheld
1.5. Symbols and arrangement
2. Sapir's comparisons

1. The Coos-Takelma-Penutian comparisons presented here were made by Edward Sapir. Morris Swadesh has prepared them for publication and has provided the introductory information and discussion.

1.1. Sapir's manuscript, which now forms part of the Franz Boas Collection of the American Philosophical Society, evidently dates back to about 1914, the publication year of Leo J. Frachtenberg's Coos, An Illustrative Sketch, Extract from Handbook of American Indian Languages (BAE-B 40.2.297–429). It surely represents an important part, though far from all, of the lexical evidence Sapir refers to in A Characteristic Penutian Form of Stem (IJAL 2.58-67), published in 1921. In this article he concurs with Frachtenberg's suggestion of Penutian affinities of certain Oregon languages, stating:

> All this is very interesting to me, as it chimes with conclusions or hypotheses I had arrived at independently. On the appearance of Frachtenberg's Coos grammar it soon became clear to me that the morphological and lexical resemblances between Takelma and Coos were too numerous and fundamental to be explained away by accident or plausibly accounted for by borrowing. The appearance of Frachtenberg's Siuslaw material has only tended to confirm this impression, further, to make it perfectly obvious that Coos and Siuslaw, as Frachtenberg announces, are divergent representatives of a single linguistic stock. Meanwhile comparisons of Takelma, Coos, and Siuslaw with Dixon and Kroeber's Penutian group of California (Costanoan, Miwok, Yokuts, Wintun, and Maidu disclosed an astonishing number of both lexical and morphological correspondences. . . . In spite of our slight knowledge of most of the Californian languages involved, I succeeded in getting together what I believe to be a quite respectable mass of evidence tending to unite the southern languages with those of Oregon into a large and highly differentiated "stock".

In the same article Sapir refers to evidence for still further Penutian relationships. It is possible that other manuscripts will yet be discovered containing this material. Much of it may have been in the form of marginal annotations made by Sapir in books and reprints, like those compiled in Comparative Penutian Glosses by Edward Sapir, in the Boas Collection.

1.2. The present manuscript consists of 13 pages 8 x 11, handwritten in Sapir's usual small writing. There are 152 numbered groups of cognates, with columns for Coos, Takelma, Penutian. There is no other title. At least two shades of ink are distinguishable, a dark blue for all but set 152, and a lighter blue for the latter and for additions to the first 151 sets. Since the additions include items in the Coos column marked "Mil." (that is Miluk dialect of Coos) and four annotations of 'see L.U.' (that is, Lower Umpqua or Siuslaw), one may infer that the main list was made before and the added notes after the appearance of Frachtenberg's Coos and Siuslawan sketches. The original Coos items must then have been based on Frachtenberg's Coos Texts, which appeared in 1913. This assumption is corroborated by the fact that Sapir's copy of Coos Texts has marginal glosses of Takelma comparisons in what seems to be the same ink as the manuscript list, and there are 'L.U.' annotations in the lighter ink. All the foregoing observations on the ink used in the manuscript were made by inspection only. The identifications seem for the most part quite obvious, except for those parts of the manuscript which have been most affected by light.

Besides the entry numbers the manuscript has a set of check marks varying with a diagonal criss-cross at a few points. Sapir used such marks to register a later critical reexamination of his work. That is, at some time after he had made the list, he must have gone through it again, with constant reference to the sources, checking the entries which seemed plausible and putting the criss-cross by the ones that on reflection seem improbable. During this process he would often insert additions to the original material. In the present manuscript, we find that the criss-cross sometimes confirms and sometimes overrides an earlier hesitancy reflected by parenthesized question mark or annotations (e.g. in 57 after the Yokuts form: "perhaps better to Tak. -ha-n, no. 55"). Three asterisks between entries 55 and 56 may be a pause mark, showing where Sapir had temporarily stopped in his check-up. A short horizontal line between 86 and 87 is evidently another pause mark.

1.3. The manuscript does not include any full analysis of phonological relationships. However, one finds phonological notes at various points. Some of these merit general comment. The occurrence of Yokuts d for earlier l is indicated or implied in a number of places (8, 9, 19, 50, 54, 71, 72, 74, 78, 79, 83, 84, 87, 94, 95); Newman's work[1] has since shown that this is a regular dialectal development in Wikchamni, while the other dialects preserve the lateral. In two cases (10, 23) we have Wintun ƛ, Takelma s reconstructed to ɬ; item 7, disregarding the first Coos form (Hanis dialect), suggests that ɬ or ƛ might be a better reconstruction. The development of Takelma x from earlier s is posited in 11, 35, 41, 61, 75, 99, 121, 123. The origin of Takelma s from earlier c is suggested in 129. This fits in with the fact that Takelma has no c even though it has s and the combination s?, the latter being pronounced as a glottalized affricate. Sapir's idea was evidently that pre-Takelma s changed to x, coinciding with original x, and that new instances of s developed out of older c and ch. The evidence in general seems to bear out Sapir's theory, but the proof is complicated by the presence of more than one s-sound in Yokuts, Coos and perhaps other Penutian languages, and by the existence of two x-sounds in Coos and Siuslaw. Robert Shafer has attempted a clarification of Penutian k and x-sounds,[2] but he does not fully succeed; his material is insufficient in quantity and does not properly distinguish between probable cognates and similarities which might have resulted from borrowing. However, the problem may be expected to yield to patient research in the future.

Where Sapir gives two or more spellings for a word, they may be variant phonetic recordings of one and the same form, dialect variants (as in Yokuts), or functional variants (e.g. verb stem and aorist stem in Takelma). The first kind of variation is here eliminated to the extent possible by using phonemic spellings. The other two types have been retained because of their value in tracing phonological relationships.

For Yokuts it was desirable and easily possible, by consulting Newman's monograph and with additional data kindly provided by Newman, to specify the dialect of most of the cited forms. Where Sapir gives a single form and it coincides with the Yawelmani dialect, it has been labeled Yawelmani (Yy). Where Sapir's form is from another dialect or includes more than one dialect, the Yawelmani has been added after Sapir's Yokuts entry.

1.4. Why did Sapir not publish his Coos-Takelma-Penutian evidence?[3] The answer is perhaps suggested by the following remarks (IJAL 2.59, 1921):

> Unfamiliarity with Alsea (Yakonan) and Kalapuya made it impossible for me to follow

[1] See Stanley S. Newman, Yokuts, Viking Fund Publications in Anthropology 2 (1944), p. 16.

[2] Penutian, IJAL, 13.205–19 (1947).

[3] Some of Sapir's comparisons and structural observations are included in L. S. Freelander, The Relationship of Mixe to the Penutian Family, IJAL 6.28–33 (1930).

the chain of evidence geographically. Nevertheless, Chinookan points of contact soon manifested themselves too persistently to be brushed aside. After hesitating for a long while to take up seriously the possibility of affiliating Chinook, one of the most isolated and morphologically specialized languages in America, with the Penutian languages of Oregon, I now find myself forced by the evidence to admit such an affiliation as not only possible but decidedly probable. . .

The greatest surprise was still awaiting me. Tsimshian . . . Should it be possible to demonstrate (and I am fairly sanguine that it can be demonstrated) that Tsimshian is a detached northern offshoot of Penutian, we would be compelled to face a most interesting fact in linguistic differentiation and in the distribution of American tribes.

These comments show that Sapir considered the Coos-Takelma-Penutian relationship to be part of a larger grouping which he felt could be demonstrated. Evidently he was awaiting the appearance of Kalapuya data and was hoping to work out in detail the relationship of Chinookan and Tsimshian. He felt sufficiently sure of himself to publicly state his theory, but perhaps he thought it well to wait with the specific lexical data until he could present the evidence for the fuller picture. The case would then be comparable to that of Sapir's theory relating Na-dene and Sino-Tibetan.[4] When students asked Sapir why he did not publish his evidence for this connection, he said it might be better to hold off until he had worked out and published the full details of Athapaskan phonology. However, in retrospect, one can only regret that this material was not published long ago.

1.5. Sapir's 1914 orthography is here modernized and spellings are given in phonemicized form to the extent possible. In the case of Takelma, we take the aspirates to be clusters of stop with h and the glottalized to be clusters with glottal stop; Takelma accent is here reduced, with reasonable justification inferred from Sapir's description,[5] to two types, a normal accent (ˊ) with tonal variations according to position in the word, and a rising or sustained long accent (ˊ) occurring on long vowels or on vowel-sonant groups in contrast to falling tone for the normal accent in this position.

Points of phonetic usage: χ is for back velar spirant, c is for sibilant affricate (ts), ч for shibilant affricate, double letters are used for long vowels, ʀ is for voiced velar spirant (in Coos). The languages are abbreviated by using the first letter for Takelma, Coos, Siuslawan, Yokuts, Wintun, the first two letters for Chinook, Miwok, Maidu, Mukne (Costanoan—Freelander's term). Yy is used for the Yawelmani dialect of Yokuts.

For convenience in printing, Sapir's columnar arrangement of the manuscript has been dropped. Sapir's diagonal cross for improbable comparisons is retained, his check marks are omitted. His parenthetic question marks, also indicating doubt, are retained but are placed after rather than before the entry. Other than in such matters of arrangement, punctuation and phonetic symbols, the materials are given as listed by Sapir.

2. 1. T kuu-x-*wife* (?) (see S); Mi kule, kulei *wife, woman*, Ma küla *woman*. 2. C kʷaaχaƛ *bow*; T gál? *bow*; Mi kono, W kul-sak *bow*. 3. C walwal *knife*; T wiili-*knife*; Mi hulaya *knife*. 4. tŭu *good* (aor. tuuwuu-k- *to be good*); Mi towi-s *good*. ×5. C asoo *again*, asoow-is *second*; Mi os(s)a, otta *two*. 6. C e?n-eeч *mother*, niika *mother!*; T hin-, ni-*mother*; W nen-чu, nenin, Ma ne, Mu ana *mother*. 7. C чuuł *nose*, Miluk łin-nuuq; T sin-, sinii-x- *nose*; W ƛinik, suno, Y tüŋük *nose*, Yy tiniḵ. 8. C helta *tongue*; T elá *tongue*; Ma eni, W tahal, Mi le-mtep, le-tip, Mu las, lase, lasa, Y talxaṭ, ?aladis, m-ada-ṭ *tongue*, Yy talxaṭ *tongue*, ?aalaṯ- *to lick*. 9. C kχla *leg*; T kʷel- *leg*; W koli *leg* (<*kʷili ?), Mu kolo, koro *foot*, Mi kollo

[4] See discussion (by Morris Swadesh) of Athapaskan and Sino-Tibetan by Robert Shafer, IJAL 18.178–81 (1952).

[5] Takelma, Handbook of American Indian Languages, 40.2.17–18 (1922).

foot, Y kada-ʃa *lower leg*, Yy ƙalassaʔ. 10. C Miluk ʉil-li *leg*; T sal- *foot* (<*ʈal-ʔ); W ƛel-ma (<*ʈel-ʔ).

11. T xŭuʔn *night* (for x:s, cf. xí *water* below); W sinol *night*. 12. T bĕe *sun, day*. pŏo *now, today*; Ma poko *sun*, W po *day*, Y ʔopo-do *sun*, ʔop-di *day*, Yy ʔop *moon*. 13. T nŏox *rain-*, W luha *rain*. 14. T pʔii *fire*; W po *fire*. 15. T sʔăaw *lake*; W чahi lake. 16. T sŏm *mountain* (<*ʈomʔ); W toƛ, чoƛ *mountain*. 17. T tăn *rock*; W ʃon *rock*. 18. C ʃximł *black bear*; T xămk *grizzly bear*; W ʃilai *bear, grizzly* bear. 19. T -sʔil *red*; W tulu-ka, tede-kit *red*. 20. C ləɾi *good*; W laiyok *good*.

21. T má *thou*; W mi *thou*. [see 47]. 22. T pam- *up*, pam-ís *sky*; W panti-be *up*, panti *on, upon*. 23. tqanƛ- (?) [to hit, to strike with instrument]; T saansan-, sana- *to fight with, spear*; W ƛila *to shoot* (<*ʈanaʔ). 24. T -t present participle, adjective suffix; W -u-t future participle, -t adjective suffix with subjective noun, Ma -do- present participle. 25. T -khiʔ, -kiʔ if; W -kila conditional. 26. C -uu interrogative suffix; W -wi interrogative. 27. T -deʔ, theʔ *I* (intr.), future -tee, -thee; W -da *I*, Mi -t, -te *I*, *me, my*. 28. C iin *not*; T ʔánniiʔ *not*; W eleu (<*ene-uʔ), Y am, Yy ʔohom, Mi (E.) ela. 29. T yaan-, yana- *to go*; W hara *to go*. 30. T pănx *hunger*; W bira *to be hungry*.

31. C ʈkʷ- *to kick*; T tkuuntkan-, tkuun- *to kick*; W чow(a) *to kick*. 32. -eenii reciprocal verb suffix, -inii (*relatives*) *to one another*; T -an- reciprocal verb suffix; W -pu-ra reciprocal verb suffix (?). 33. T ʔal- *to* (?), ka-năn *in*; W el *in, into*. 34. T pay- *out of house* (vb. prefix); W pat *out*. 35. C yipsn *three* (?) (see S [ʃiinχ]); T xipiní *three*; Ma sapwi *three*, Yy ʂoopin, Mu kapan, kaphan, kapxan *three*. 36. C ʃuuƛ- *to set fire to*, ʉil- *to burn*, ʉweeł *fire*; T -sʔülüü-, -sʔül- *to set fire to, to catch fire*; Ma sa, Y ʔoʃit, Yy ʔoʂit, Mu ʃoto *fire*. 37. C mee *human being*; Mu ama *person*, Ma mai-dü *Indian*, mai-ki *boy*, Y may *person*. 38. T yapʔá *person*; W yapaitu *person*, Ma yepi *man, husband*. 39. T tak-ax- *head*; Mu taxa-ʃ *head*. 40. C χʷilluχʷ *head* (?); T ʔülü-kʔ-i- *hair of head*; Mu uʈ, uri, uli *hair*, Yy ʔoʈow *head*, Ma ono *head*.

41. C ʃi *to drink*; T xí *water*; Mu si *water*, Ma sewi *river*, Mi kik *water*. 42. C ƛipiɥ *arrow*; Mu tep-s, ʈemo-x, чemo *arrow*. 43. C lqawe *to die*; T lohoy-, loho- *to die*; Mu laku- *dead*. 44. C cimsimt *to sleep* (plur., redupl. <*ʈim-t or reformed from *iŋʈim > *ʈ-iŋʈim); Mu eʈen, eчen, etin-i *to sleep*, Mi eɥ, Y ʔeŋʈim, Yy ʔenʈam *a sleep-inducing substance*. (Is Esselen acin- after all merely borrowed from Costanoan?). 45. T ti interrogative enclitic; Mi mau-ti *who?* hi-ti *what?* Ma -de interrogative, Y ti enclitic, Mu -sa, -s (<*-ti). 46. C n- *I*; T -ʔn *I—him*, -n (fut.) *I—him*; Ma ni *I*, W ni, Yy naʔ. 47. T má *thou*; Mu me, men, mene, Mi mi, Yy maʔ, W mi, Ma mi *thou*. 48. C ƛ̇taa *earth* (?) (see S [ƛaʔay]); T tkăa *earth*; Ma kau *ground*. 49. Ch -k-, -x- *my*; T ki *I*, -te-k, -t-k *my*, kŏom *we*; Mu ka, kan, kana *I*, Mi kanni *I*, -ka, -ka-n *my*. 50. C -en numeral suffix *so and so many times*; T -n, -(t)án adverbial numeral suffix; Mu -na adverbial numeral suffix, Ma -nini, Y -d, -l, Yy -ʔ . . . il'.

51. C puuχʷ- *to spout*; T phoophaw-, phoow- *to blow*; Ma bö *to blow*. 52. T mená *bear*; Y moloy *bear*, Ma möde *brown bear*. 53. T maan- *to count*; Ma -mak- *to know, count, measure*. 54. C -enii *to do, to make something*; T -(a)n(a)- causative verb suffix; Mi -ne causative, Y -la, -da causative (for l < n, cf. no. 50), Yy -aala. 55. C -n, -ni-, -eene plural element found in few nouns (e.g. mee-n *human beings*, ceey-eene *small* pl., чe-ni-xet *short* pl.)—its irregularity and rarity show it to be survival from remote past; T -ha-n, -an noun plural (not very frequent); Y -n, -in plural of pronouns, -in numeral collective, W -l dual of pronouns, -li-t dual obj., -le-t plur. obj., -li-n dual pos., -le-n plur. pos., Ma -nono *many* (?).

56. C -e, -ii petrified noun plural (e.g. tummeeƛ-e *old men*, timił-ii *men*, keneeyes-e *hunchbacks*); -a petrified noun plural (e.g. aƛimaq-a *big* pl.); Y -i, -a noun plural (for

Y ablaut, e.g. ʔonmid: ʔonemad-i, cf. C toomiƛ: tummeeƛ-e, knes: keneeyes-e), Yy -i, -a subject case with plural stems. ×57. C hinna *so and so many each*; Y -hin collective (e.g. yapkan-hin *many trees*) (perhaps better to T -ha-n, no. 55). 58. T ʔuukʷ- *to drink*; Yy ʔugun- *to drink*, Mu ukis, Mi uhu. 59. T ka *that* (indef.); Y ka *that* (vis.), Mi i-ka *that*. 60. C t *that there*, ta *so, such*, te- article with pos. pronoun; T ii-ta (ka) *that yonder*; Y ta *that* (inv.), Yy ţa *that*.

61. C -is noun suffix (often suffixed to verb stems: ƛeey-is *language* ƛee-c *he spoke*), -s, -t-s, -en-is nouns of quality; T -(a)x infinitive (often used as verbal noun: S ʔipn-áx *speech*); Mu -s noun-forming from verb stems (e.g. niч-s *language* < niч *to speak*), W -s verbal noun suf., Mi -s noun ending (?), Y -oʃ noun suf. 62. C -ne *it is* (e.g. n-ne *it is I*); T -(a)n-, -in- petrified intransitive suffix; Y -in- intrans. (?), Mi -ne, -ñe intransitive verbifying. 63. C ii-ta emphatic particle; ii-ta(ka) *that*; Mi i-, i-ni, i-sa, i-mo, i-ka, i-ti *that*. 64. T -n noun ending (e.g. yiwi-n *speech* < yiw *to speak*); Ma -n infinitive ending. 65. T -áʔn *person, people of*; Yy -ʔ . . . inin *people of*. 66. C aχaax *maternal uncle*.; T has- *maternal uncle*; Y ʔagaʃ *mother's brother*, Yy ʔaagaş. 67. C чinłчin *eyebrow*; Y чimeɹid *eyebrows and lashes*. 68. C cneex *beard*; Y ɹamoʃ *beard*, Yy daaṁuţ. 69. C kʷin-c *throat, neck*, kʷin- *to swallow* (Coos kw: T kʷ, cf. kʷees-is wind, T kʷălt); T kʷen- neck; Yy ʔoogun, Ma kuyi *neck*. ×70. ƛpene *wings, feathers*; Y ṗaʔada *fur feathers* (?).

71. T telk-án *buttocks*; Y teda *anus*, Yy ţooţoʔ. 72. T nihwík^{w} *black bear*; Y duʔuxun *bear* (<*luʔuxu-). 73. teec *lice* (see S); T tʔelá *louse* (?); Y teheţ *head louse*, Yy tiʔiţ. 74. T láap *leaf*; Y dapdap *leaf* (<*lap-). 75. T bix-ál *moon* (?) (x < ʃ); Y ʔupiʃ *moon* (cf. *sun*), Yy ʔop. ×76. C tqeen *soot*; Y чeheŋ *fog*. 77. T tkʷá *thunder*; Y ţakaʔa *thunder*. 78. C lahƛ-is *earth*; Y düŋüt *earth* (<*lüŋüt). 79. T hokʷ-ăl, -hókʷh-al *hole* (<*-ʃokʷal); Y ʃogod *hole* (<*ʃogol), Yy şogol. 80. T tkism- *green*; Y чiiʔimat *green*.

81. T -tkĕm *black*; Y чimgutan *black*. 82. T mii *now, then* (particle); Yy ʔamaʔ *and then, then*. 83. C liixlii *to pass out, to pass by, landing place*; Y day (<*lay), lay *to step, to kick*. 84. C al-ʃ *toy*; T loo-l-, loo- *to play*, loo-sí *toy*; Y do *to play* (<*lo). 85. C tooh-, tous- *to hit, strike*; T tʔomom-, toom- *to hit, kill*; Y do *battle*, (?), doʃ *to beat, overcome* (?), Ma -tul- *to break flat thing* (?), tup-, tus- *to break* (cf. 117). 86. C ƛou- *to eat*; Y duy *to eat* (<*luy). 87. T -(a)l-, -ˇlha- continuative, frequentative; Y -ad (<*-al) continuative, -li frequentative. 88. C mauχ- *to chew* (*up*) (cf. Ch); Y mök *to swallow*, Yy meeki-. ×89. C nix(t)- *to touch*; Yy niţi- *to squeeze with hand*. 90. C tou- *to fall*; Y ʔot- *to fall*.

×91. C tч- *to come in*; Y tax- *to come*. 92. C ʃanx- *to shake* (see S); T sʔelel-, sʔeel- *to rattle* (?); Y ţaŋit *to shake*. 93. C чau- *to come apart, to pull apart*; Yy ţaţay- *to break*, Y ţaw *to overcome*. 94. T helel-, heel- *to sing*; Y ʔüdük-, Yy ʔilik- *to sing*. 95. C welexˇ- *to stoop, to lie down*; Y wodo *to dodge* (<*wolo), Yy wolooyee-. 96. C wʃkin- *to touch with stick*; Yy woţo- *to hit with a stick*. 97. C yakʷ-, yakʷ-t- *to pick, to gather* (see S); Y yam- *to gather seeds*, yitw- *to gather*. 98. T -koyo-kʔ-, -koy-kʔ- *to touch, nudge*; Yy koyo- *to butt*. 99. C xil- *to look around* (?); T -xanaw- *to look* (*out*) (?); Y şil'i- *to see*, Yy şil'i-. ×100. C xint- *to go fast, to run* (?); Y şilit- *to jump*, Yy şilit-.

101. T wayaan-, way- *to sleep*; Y woy- *to sleep*, Yy wooʔuy-. 102. T mahăy *large*; Y meţ, maţ, may- *large*, Yy maẏaahay. 103. T khay- *woman, girl*; Yy gaaʔiña *woman, girl*. ×104. T tolá *hollow tree*; Y ton, toŋa-ʃ *digger pine*. 105. C kós *shell used for ornament*; Y guʔiч *beads*. 106. T sʔíxi *dog*; Y чeʃeʃ, чexa, Ma sü, Mu чuчu *dog*. 107. T hăay *cloud*; Ma yaa *cloud* (?). 108. T ní, nii- *teats*; Ma mini *nipples* (dissimilated < *ninir). 109. T -kʔotkʔat-, -kʔoot- *to break in two*; Ma -kot-, -kut- *to divide*. 110. T kele-k, kel-k- *to drill for fire*; Ma -kel- *to perforate*.

111. C qal- *to dig* (?); T kʔolol-, kool- *to dig*; Ma -kol- *to bore* (?). 112. T kala-p-, kal-p- *to twist* (*thread*) *by rolling*; Ma -köl- *to*

roll. 113. T k?ataay-, k?aat- *to pick, pluck*; Ma -ket- *to graze*. 114. T lopap-, loop- *to pound (acorns, seeds)*; Ma -lop- *to move with friction* (?). ×115. C six- *to shake off*; Ma -sil- *to shake* (?) (see no. 92 [in different ink, showing that comparison with 92 was probably made after the original entry and after the entry had been marked with criss-cross]).

×116. T tama-k?-, tam-k?- *to choke*; Ma -tap- *to squeeze* (?). 117. T -tkʷeltkʷal-, tkʷeel- *to break in two*; Ma -tala- *to crush* (?). 118. T t?alal-, taal- *to crack*; Ma -tala- *to crush* (?). 119. C -aami *I, we 2*, or *we-thee, you 2*, or *you*; T -(i)k-am *we* (fut. subj. intr.), -(a)nak-am *we* (fut. subj. trans.), -am *us*, -t-ám *our*; Mi -ma(si) *our*, -m, -me *us, me* (subj. 1 [sic]). 120. T -nk *he* (fut. trans. subj.); Mi -k, -kö *him, he* (subj. 1, including future), W -k he (past).

121. T -xi *me, I* (subj. of passive) (<*-si); Ma -s(i) *I*, Mi mu-su, mö-s, mu-ʃu, ʃi-ma *I—thee*. 122. C -aa?is *thou, ye 2*, or *ye—me, us 2, or us*; W -s-ka, -s-ke-n *thou, ye 2, ye* (-ka, -ke- as in Ma -nka-no *thou, ye 2, ye*, -nka-s *we 2*, -nke-s *we?*), Mi -s *thou*, -tok-su *ye* (subj. 3: present and perfect). 123. T -x non-agentive (quasi-passive or reflexive), -al-x intransitive (-x < *-s); Ma -us reflexive, Mu -s-tap, -s-tapse impersonal, passive (?), Y -wi-ʃ, -wi-s reflexive, Mi -si passive. 124. C C χeen-is *sick*; T xil-ăm *sick* (<*xin-ăn); Mi hali *sick*. 125. T -molo?mal-, mol?mal- *to turn things over, stir food in basket-bucket*; Mi mole *to spill*.

126. T phili-phal-, philphal- *to squash (insects), to whip (children)*; Mi pilapa *to pinch* (?). 127. T -hit, -thit plural of adjectives; Mi -ti plural of adjectives and verbs, W -te subjective pronoun plur. 128. T -k inferential past; Mi -ke, -ka past. 129. T -sii, -saa agentive (-s- < *-c-); Y -iɥ, -ic agent, Yy -ić. 130. C -a-?eiwat causative frequentative (-eiwat frequentative), -iya-t causative, -e-?et (-a-?at) causative passive (-et, -at passive); Y -i, -u, -a causative.

131. T -(a)pa? *let us*!; Ma -pö, -pe, -pe?e *let us*! ×132. C -qm, -χm *to be in a condition, to be in the act of*; Mi -imi continuative (?). 133. C -ɥ instrumental noun suffix; Mu -cu comitative (?). 134. C -et (-at) past passive; Y -t passive, -n-it future passive. 135. -iiyas plur. of nouns of relationship, -iiye, -eeye adjective plur.; Mi -ya noun plur. 136. C han *about to*, hanƛ *shall, will*; Y hi future particle. 137. C kʷa *it seems, as if*, hakʷa-ł *as if, kind of*; Y akam *perhaps, it seems*. 138. C hiɥ particle indicating surprise; T hís *almost, trying to but in vain*; Y hiɥa *perhaps*. 139. C hei emphasizing particle, hi enclitic emphasizer *indeed*; Ma -hehe *only, just*. 140. C qa-ł *down, below, under* (<qa + ał, qa- is local adverbial prefix), qa-łin *from under* (<qa- + ałin); Y ?adid *down, low, below* (<*?alil).

141. C yuu *very, very much*; Yy yow *and, also, again*. 142. T -ta? subordinating suffix of intransitive aorist; Ma -we-te *after having* (for -we- cf. -wea and -weu temporal suffixes), -ce-te *when, while*, -ya-tan past participle (for -ya- cf. -yak temporal suffix). 143. T -na? subordinating suffix of inferential past and transitive aorist; Ma -wono past participle (-wo- assimilated to -no, <-we- as above). 144. T -ma? subordinating suffix of aorist passives, -tát *from, to, in—direction*, -t locative (occurs in very few isolated adverbs: kʷĕn-t *in back, behind* < kʷen- *neck, nape, back*), -(a)tá local adverbial suffix; Ma -di *in, on, at* (?), Mi -ta *for*, Mu -ta, -ta-k locative, -ta-ʃ *in, on, at*. 146. T -kʷa- comitative verb suffix; M -kö *having*. ×147. C witin *blood*; Mi weteti, wetete *red*. ×148. C -ume *where . . . is*; Mi -m, -mö locative, Mu -me *with, at the house of*, -m, -mo. 149. C -a imperative with object of third person; Mu -i imperative with object of third person. 150. C -is, -inis *place of*; Y -lis *habitual place of* (-l- frequentative).

151. T -(á)n aorist passive; Y -han passive in dependent clauses. 152. See S [-uus locative]; Y -w locative.

RELATIONS BETWEEN NOOTKA AND QUILEUTE

MANUEL J. ANDRADE†

[0. Editorial note by Morris Swadesh]
1. Cognates
2. Structural similarities
3. Borrowings

[0. Since about 1930 I have known that Manuel J. Andrade made a comparison of Nootka and Quileute, with results which were considered positive, that is indicative of common origin, by Andrade himself and by Edward Sapir but which were discounted by Franz Boas. I recall a comment of Boas that Andrade had found only 18 percent of agreement between Nootka and Quileute; Boas did not consider this sufficient to prove common origin. However, I had not seen Andrade's manuscript until after my own study of Mosan (IJAL 19.26-44) was in press. In September 1952, Norman McQuown showed me some manuscripts left behind by Andrade, and among them we found one of 9 pages with the title given above and containing the material given here. Some marginal notes in Boas' hand give Kwakiutl forms alongside the Nootka. Although my study of Mosan was based on more extensive material than was available to Andrade and goes beyond his results, nevertheless it is of interest to place on record the prior proof that he had found. This not only gives due credit of priority to Andrade but also serves to demonstrate the capacity of scholarship to discern distant genetic relationship even on the basis of limited materials.

In editing Andrade's material for publication, it seemed worthwhile to rearrange it somewhat in the interests of brevity. The manuscript has an initial list of presumable cognates, followed by a list of borrowings, then by several auxiliary lists illustrating sound correspondences, then by a long list of additional cognates and finally by a short list of "stems of more than two syllables which have two contiguous syllables with phonetic relation though the third element seems unrelated". We present this material here in two lists—one of presumable cognates, the other of probable borrowings. We omit from the cognate list a certain number of comparisons which seem to be impossibly related in the light of the otherwise established sound correspondences; if the reader should wish to examine these omitted comparisons, the original manuscript is now preserved in the Boas Collection of the American Philosophical Society Library. Andrade's discussion of sound correspondences and of the quantitative aspects of his evidence is given at the end of the cognate list. I have normalized the spelling to conform with recent usage. In the case of Nootka, I have corrected a few details of phonetics.]

1. The correspondence between the following stems and suffixes is quite obvious, and it may be considered significant, as they stand for concepts that are not related to objects that may be borrowed [listed Nootka first, then Quileute; Boas' Kwakiutl inserts are given in parentheses]:

-kʷa- *completeness*, -qʷa *completely, totally*; ʔu- formative stem (Kw. ʔu-), ʔuu- formative stem for space relations; hi(n)- formative stem, hii- formative stem for action; -ċu *to have inside*, -ču *to have inside*; -s first person, -s first person possessive; -wi-, -wa *beach*; -q *traveling in canoe*, -qa, -tq *canoe*; kuʜ (Kw. kʷaχʷ), kax *hole*; ƛaaq *fat, blubber* (Kw. ƛina *oil*), ƛiik *fat, blubber*; ƛaqapt *bush* [-apt *plant*], ƛiiq̇a-pat *bush* (-pat generic suffix for trees, plants); ƙuc- (Kw. ƙʷas), -q̇uc *small mussel*; taaxʷ-, tuxʷ- *to spit*; puuxʷ- *to blow, to float* (Kw. puxʷ-), puxʷ- *to be blown, to drift*; ẇaqʔuu *to go where invited* (Kw. waq- *to eat with wife*), wiiqʷ- *to assemble, to meet at a place*; su-kʷiƛ *get hold of* (Hailtsuk su), -suqʷ *to catch*; -ʔaqƛ *knowing, in mind, inside*, -aqɬti *expert*;

mač- *dirty*, bas *dirty*; mał- *to move about*, biyił *to move, to budge*; muu (Salish muus), ba?yas *four* (yas is common to other numerals); wi- *not to be* (Kw. wi), wa *not, not to be*; xic- *to crush*, xʷać- *to hit with a club*; ?aqi-, ?akis *what*; hayaa-, hiči? *afraid*; hawii, hiyu *to cease*; hačis, haakuł *near*; N. yaa?ał *to look on*, -u?ał *to see*, Q. -qał *to look at*; wačin (Kw. -kn), ?uu-ƙis *body*; taał- *to feel warm*, ƚax- *to warm*; tuxʷ- (Kw. dxʷ-), tiƙ- *to jump*; ƚuн-, ƚiiqʷ *head*; nača, -daqʷa *tail*; niča nose, disus-it *nose* (-it nominalizer); či-, ƙat- *to cut*; čin- (Kw. ƙna?is-), ƙi?yi *to feel cold*; kaa?uuc, quaxuulit *grandchild*; kʷikʷinksu *finger, hand*, kʷadiit *finger*; -?ath suffix for name of tribes, -(a)ƚ *to live*, suffix for names of tribes (*those who live at*); kuuẇił, ƙukut *to steal*; ƙacq-, ƙʷadaq *to tear, to break*; ƙuuqʷaa *silently, to stalk*, kuba *quiet*; qit- *to tie around*, ƙi- *to tie*; sayaa *to be distant*, sawa *to go far*; ćaƙu- *earth, soil* (Kw. ʒqʷ-), ćiġa?ati *earth, ground*; ćaxʷ- *to spear*, ćiġak *spear*; łukʷ- (Kw. łkʷ- *to pull*—?), ƛik *sinew*; ƛupk-, ƛaxʷ- *to wake*; ƛuн- (Kw. ƛq-), ƛaġ- *to slap*; -?ik future tense, Chemakum -kʷi future; -e?ic 2nd pers. sing., -ič 2nd pers. sing; -q?ičн, -xiksxa *year*; ?iiqн-uk *to tell things*, ?ixuwaqaw *to convey news*; te?ił-, tiłuut *berry*.

Nootka m = Quil. b. Nootka i = Quil. a (cf. Quil. kadidu = Chemakum činanu). Nootka n = Quil. l [probably applies only in borrowed words, taken by Nootka from Quileute or by both from a common source]. Nootka k-sound = Quil. č [Andrade's examples here are few and unconvincing; Quileute č, as shown by a few of his examples, should be equated with Nootka c]. Nootka m = Quil. p, w [probably incorrect].

[Andrade's list includes a number of superficially similar comparisons which contradict the sound correspondences otherwise established, e.g. Nootka čiiq- to fight, Quil. čaq- to fight. They also include some loosely compared instances, like N. tum-, Q. šip *black*, or N. ńayi *an echo*, Q. -layu *distant sound*. Such cases are omitted here.]

Not counting repeated pairs, that is, words which I listed more than once in the 4th, 5th and 6th groups [refers to the arrangement in the ms.], we have here a total of 138 possible cognate relations. The number of words and suffixes that I was able to compare on the basis of identity of meaning is 523. This means that in more than 26 percent of the cases some possibility of relation was found. If we were to take in consideration those whose meanings are analogous, and others with stems of more than two syllables which have two contiguous syllables with phonetic relation though the third element seems unrelated, we could add 20 more.

[Andrade's list, as rigidly reduced here to cases where the sound correspondences are consistent with a likely pattern and eliminating elements which might well be borrowed, still contains 53 comparisons. This number, amounting to 10 percent, is much more than could result from sheer chance (see discussion in my Mosan paper IJAL 19.43-4).]

2. So far as I can judge by the story in the Nitinat dialect [refers to Edward Sapir, The Rival Whalers, a Nitinat Story, IJAL 3.76-102, 1924, actually in Nootka, Alberni dialect, even though the tale itself is of Nitinat origin], there are a great many points of contact between Nootka and Quileute in their general structure.

(1) Many nouns are reduplicated with the insertion of -c- or -y- in both languages: Nootka ƛi- *to shoot* ƛiiciƛiiya *to shoot several times*; Quileute ti·ła *hemlock*, tiicła *hemlocks*, kaxa? *open*, kacxa? *open many times*; Nootka čapac čaẏaapac (plural); Quileute ƛix *stiff*; ƛiiyix *quite stiff*.

(2) Reduplication is used in both languages for plurality, distributive, and iteration.

(3) Demonstrative elements perform syntatic functions in both languages in knitting together the independent elements of the sentence, and specially in subordination of clauses. Nootka, however, has no articles.

(4) Both languages have a special set of subject pronouns for interrogative sentences.

(5) The suffixes of negative and interrogative sentences are in both languages attached to special negative and interrogative stems.

(6) The invariable expression of duration in every verb complex. That is, every one must be expressed as momentary or continuative, the vowels a and i expressing the same functions in this connection in both languages.

(7) The structure of the verb complex is remarkably similar. For example: Nootka xic-kʷa-ʔap to crush to pieces, Quileute xʷac-qʷa-ʔac to destroy completely by hitting; (Stems xic-, xʷac-; Adverb -kʷa-, -qʷa-, = *totally*; Causatives -ʔap, -ʔac).

The main differences seem to be the absence of articles and the absence of gender in Nootka: but gender appears only in the Quileute article.

3. In the following the correspondences are quite obvious, but the objects may have been borrowed: čimun *halibut hook* (Kw. gmł-), čibuud *fishing hook*; kʷatyaat, q̓ʷayti *culture hero*; qaʔuuc, qaʔawac *packing basket*; ƛ̓aana *long canoe* (Haida type), ƛ̓aalay surf canoe. Probably from English rum we have: Nootka naama, Quileute laab *whiskey*.

[Several comparisons listed among Andrade's cognates seem also to be borrowings. These include:] qasqiip, qasqayap *starfish*; kakaẇin [analyzable into kaka-ẇin, made up of ka- *protruding*, reduplicated, plus -ẇin *in the middle*], kakawad *killer whale*; ƛ̓ilanuus, ƛ̓iladuus *fur seal*; xʷaašxʷaš, kʷaaškʷaš *bluejay*; ʿanałča [Nootka ʿ is a pharyngealized glottal stop, regularly going back to q̓], q̓alałču? *flounder*; kʷinyuuɬ-atʜ, kuʔliyuuɬ *Quileute*; pišpiš, puš *cat* (from Chinook?); ƛ̓apaat *basket for fish* (Kwakiutl ƛ̓abat), ƛ̓ap-čisha *basket for whale harpoons*.

[Since Nootka proper is not in contact with Quileute, it is more likely that the borrowing took place between Quileute and Makah, and indeed the Makah forms are closer to the Quileute, e.g. Makah čibuud, identical with Quileute. The direction of borrowing is not always immediately apparent, since the sound systems of Makah and Quileute are so nearly alike. In the case of kakaẇin = kakawad, the analyzable character of the word in Nootkan shows this to be the source language. For čibuud = čibuud, there may be a clue in the Kwakiutl, for if Kw. gmł- is cognate with Nootkan čim-, then the Nootkan word must be an archaism in the Wakashan stock or a very early borrowing from Kwakiutl. In several cases, the compared elements also have analogues in Salishan languages, and Salishan may indeed be the source.]

LINGUISTIC FACTORS IN THE TERMINOLOGY OF HOPI ARCHITECTURE

B. L. WHORF†

[This article was prepared by Whorf for presentation to the New York and Yale informal linguistic group at its meeting on February 25, 1940. The manuscript was among the papers left by Whorf to George L. Trager. It has been checked by Edward A. Kennard. It is printed here with two changes to conform with IJAL style—Hopi forms are set in roman with English translation in italics; lists of cited forms are set up in solid paragraphs. CFV]

The common material of Hopi buildings is stone. Adobe, the usual building material of the Rio Grande country, is rarely used. The stone is quarried and roughly dressed by the Hopi themselves, and set up without mortar. Walls are stone, roofs and floors above ground are tamped earth or clay several inches thick on a layer of close-set poles laid across cylindrical timbers or beams ledged in the walls. Interior surfaces of walls and ceilings are usually finished with a clay plaster or stucco, and then whitewashed with a fine white clay; exteriors are sometimes stuccoed, usually left in bare masonry. One-story buildings are the most frequent, but two-story ones are not uncommon, and in Walpi even occasional third stories are to be seen. Stairways and ladders, both of which are used, are external to the buildings. The pit house or kiva, used for ceremonial purposes, is essentially similar except that it is buried and wholly or partially hollowed out of the ground, its upper portion projecting like a well-curb and bearing a roof with a hatchway for the entrance ladder.

Hopi has a fairly considerable number of terms for what might be called structural elements or component parts of a building, including essential appurtenances to a building such as ladders, stairs, and windows. Such terms are grammatically all nouns. The following is a representative list; it follows the order of construction, from the foundations up.

kiŋa *foundation*, or *foundations;* te'kʷa *an erection of masonry, not a part of a finished building, unfinished wall, unroofed wall, or standing portion of a ruin;* tekʷánmère *encircling or enclosing wall;* te·wi *ledge, shelf,* or *set-back, applied both to a natural ledge and to the architectural form;* tẹkʷni *wall, chiefly a roofed wall, but also applied to a finished stone fence or rampart;* ʔe'ci *partition,* or *closure of any kind;* ʔeʔécpi, ʔecpi *door,* i.e. *closing piece or door proper;* höcíwa *door-opening, doorway;* poksö *vent-hole, unglazed window, chimney;* panávca *piece of glass, glazed window;* nayáve *adobe brick;* palwi, pálwicȍqa *plastering clay, used as stucco whitewash, and floor clay;* ki·qȏlö *lowest story of a building of more than one story, or a sunken room like a basement; story with a floor above it;* ké·vẹ̀la, ké·vẹ̀ʟpi *ceiling;* wúna *piece of timber of any kind, board, plank, post, log, pole, whether placed in structure or not;* lẹ́stà̧vi *beam or joist of roof or upper floor, timber or log for this purpose, usually when in place in the structure;* kiqálmö *eaves, or cornice;* kí·ʔà̧mi *roof* (not however the term in such expressions as 'on the roof'); kiska *tunnel or covered way, roofed passage.*

Of these 19 terms, which are some of the most common ones, eight are unanalyzable stems, or in a few cases partially and conjecturally analyzable; the other 11 are transparent derivatives or compounds.

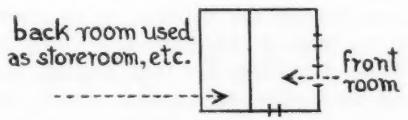
Terms of this class, all denoting structural elements or parts, are all nouns, having the noun declension of two cases, nominative and objective, and a set of construct-state or possessed forms. They all denote three-dimensional solids in the geometrical sense, solid and rigid masses, or definitely bounded areas on or perforations through such solids.

As we look over the grammatical class of nouns we are struck by the absence of terms for interior three-dimensional spaces, such

as our words *room, chamber, hall, passage = interior passage, cell, crypt, cellar, attic, loft, vault, storeroom*, etc., in spite of the fact that Hopi buildings are frequently divided into several rooms, sometimes specialized for different occupancies. We should never notice this state of affairs unless we approached it from the grammatical viewpoint first, for if we simply ask the informant for the word for 'room' we shall certainly get a reply—a word which to him is the equivalent and translation of our word *room*. Nevertheless, this word, and a few other words used to denote interior spaces, on examination will be found to have different grammatical or paradigmatic properties from the words for architectural elements or structural members which we have just noted. They do not seem to be nouns in the strict sense at least. The word for *room* ʔá'pạ̀vɛʔ, has no nominative or objective case and no construct state; one cannot say, based on this stem, 'my room', whereas one CAN say 'my door' or 'my ceiling' even though these expressions have no socially functioning meaning, for Hopi society does not reveal any individual proprietorship or retainership of EITHER rooms, doors, OR ceilings. Here we see the difference between a purely linguistic or formulaic meaning, which COULD be said but probably would not be said, like 'my ceiling', and the case of a cultural and practically recognizable meaning which also coincides with linguistic meaning, like 'my house'. On the contrary, an expression formally equivalent to English 'my room' DOES NOT EXIST, or have even a formulaic meaning; there is a gap here in the language as compared to ours. If the Hopi should borrow from us the custom of having individual 'own' rooms, or should rent individual rooms when they visited other Hopi villages, they would STILL be unable to say 'my room'. What they would probably do would be to coin a new expression for this need. There are many ways they could do this. They could say for instance 'my ceiling', 'my door', or 'my floor', and in time the word *ceiling, door*, or *floor* as the case might be, would acquire the extended meaning of an individual person's own room, like French *foyer* 'hearth' meaning one's home. This slight digression from the main topic will serve to illustrate the conservativism of grammatical patterns and their resistance to change as compared to simple lexical items.

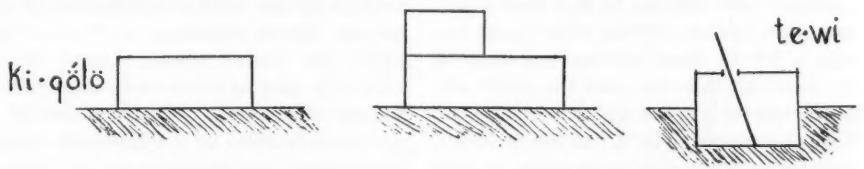
Returning to the word for *room* ʔá'pạ̀vɛʔ, let us examine its case properties. Though it has not the noun cases nominative and objective, it has the cases locative, illative, and ablative ʔá'pạvɛʔ, ʔá'pạ̀miq, ʔá'pạ̀ŋk, case-relations which are found among pronouns, along with a number of others of similar nature called the locational cases. But pronouns have the nominative and objective cases also, as well as other peculiar properties all their own. It will be found that ʔá'pạ̀vɛʔ belongs to a part of speech called LOCATORS, which include such words as *here, there, above, below, in front, in back, north, south, east, west*, and a good many others, among them the Hopi geographical names, such as Oraibi, Walpi, Shipaulovi, etc. These all have a paradigm of locational cases, and every form ends in suffix; there is no bare-stem form such as exists in nouns and therein forms the nominative. In saying *north* it is necessary to say *in the north, from the north, to the north*, etc. These are forms that all belong in the predicate, while something else serves as the subject, or else there is no subject. In other words they are adverbial forms. The word translated *room* means *in a house, room, or other enclosed chamber* or more precisely *in an architectural interior*, or INTO such an interior, or FROM such an interior, etc., according to the case suffix. The -vɛʔ suffix in ʔa'pạ̀vɛʔ is the locative. There is also a quasi-locative suffix -vi or -pi which cannot be applied to the stem ʔá'pa-, nor to most of these locationals, but can be applied to geographical place names and one or two other special words for room. Its locative

sense is so weak that it can be used as a nominative or objective noun, though this use is rare. The chief other word for interior space in a building is locative yé·mòk-vi, illative yé·mòk, often translated *the other room* or *the next room*—but it is also used equivalent to *back room, closet, recess, spare room, storeroom.* Perhaps the closest semantic effect in English would be *inner room*, though this must be construed *inner* in the sense of the Hopi illative, which would include *further room* or *adjoining room.* It is any chamber one goes INTO from another interior which is the point of reference. One of the most common room plans of a Hopi house is this:



This is in line with the way Hopi and in fact most or all Uto-Aztecan languages represent location in space, or regions of space. They are not set up as entities that can function in a sentence like terms for people, animals, or masses of matter having characteristic form, or again, human groups and human relations, but are treated as PURELY RELATIONAL CONCEPTS, of an adverbial type. Thus hollow spaces like room, chamber, hall, are not really NAMED as objects are, but are rather LOCATED, i.e. positions of other things are specified so as to show their location in such hollow spaces. Contrasted with the considerable number of terms for solid architectural members, there seems at first a remarkable paucity of terms for architectural HOLLOW SPACES, with only two stems of any practical importance. At first one might be led to ascribe this to something culturally pecular in Hopi architecture—their concepts of building construction are limited and one-sided as a given cultural fact, we might suppose. On more intimate knowledge of the language we see that it has nothing to do with the architecture that there is this paucity of terms where we have a rich array of terms; it is a matter of the structure of the language. It is not the two stems that determine paucity or richness of expression, but the large array of suffixes with locational case-endings which may be used on these stems, because they belong to the locator group. In the locator group the number of initial stems is not an important criterion of vocabulary richness, it is rather the profusion of suffixes, which in this group are in effect non-initial stems.

Now there is still a third class of architectural terms to be considered—terms for different types of buildings. There are certainly different structural types of building among the Hopi. The three main types may be illustrated by diagrams:



These buildings are put to various specialized uses. Most are dwellings, but the so-called piki-houses are used only as bakeries for baking piki or Hopi corn wafers; others are used only for storehouses, the kivas only for ceremonies. Since white influence there are buildings occupied solely as stores, churches, and schools. Now we, and many peoples much less sophisticated architecturally than the Hopi, have a vocabulary of different terms for buildings: we have the terms *house, building, cottage, castle, fort, temple, church, chapel, palace, theater, school, store, inn, hotel, barn, shed, garage, stable, hut, shack, shanty, prison, jail, tower, station,*

depot, and so on. Many of the terms denote occupancy-types, others structural types. It might be noted from a detached viewpoint that this English list is quite a miscellany and has practically no system to it. However, it seems to us the NATURAL THING, for a people who have a building technology at least as diversified as the Hopi.

Yet the fact is that except for a few marginal terms of extremely restricted application (below), the Hopi language has only one word for a building; and it may be said without any qualifications that the language has no architectural terminology that classifies buildings into types—in spite of the fact that it does have a considerable architectural terminology serving another purpose. There is only the word ki·he *house* (as usually translated), which really means *building* of any kind. This word is a noun, but the only noun of its kind in the language. This word *house*, though not compounds ending in *-house*, can serve as base or initial stem for suffixing the vocabulary of locational suffixes terminating in locational case endings, as if it were a pronoun or a locator. Certain other nouns can take a few of these suffixes, but *house* is the only one that can take the entire set. In this respect it is like a place pronoun, but it is not a pronoun, for it has the construct state forms which only nouns have, so that one can say 'my house', 'your house', etc.

The marginal cases which might possibly be considered terms for building other than ki·he may be cited, and it will be seen that these hardly denote true buildings in the usual sense: mecávki *tent*, lit. *cloth-house*—a foreign object to the Hopi, and denoted by a compound of *house;* té·tèska *shrine*—a small, crude enclosure of stones, covered over and located outdoors; kiska *tunnel*—also a covered outdoor passage with walls and roof, usually connecting different buildings.

One reason for the great paucity of Hopi building terms is that the Hopi either do not use occupancy terms as synonymous with the term for the building housing the occupancy, or if they do this they have begun to do it only recently and few terms of this sort have accumulated. They do not have, at least not firmly rooted, the pattern which is so natural to us, in which *a church*, i.e. an institution, is a term that merges quite imperceptibly into *a church* meaning a type of building used as a meeting place for this institution, with the distinction hardly felt until attention is called to it; or in which *a school*, the institution, is hardly distinguished from *a school*, i.e. a schoolhouse, or *garage* denoting a kind of occupancy from *garage* the building housing this occupancy, or *hospital* the occupancy from *hospital* the building, or *the theater* in the sense of 'the dramatic art' from *the theater*, a building. The Hopi language does not have this imperceptible fusion, but rather a distinction between the two. The occupancy and the spot of ground or floor on which the occupancy occurs is called simply 'the building', a ki·he. This is not a matter of stylistics, for it is not variable by the artistic modulations of the speaker, but of linguistics, for it is a form which the native speaker must follow willy-nilly, just as much as he must follow matters of grammar. The occupancy of a piki-house is called by a term which means 'place where the griddle is set up', but it would be called that if set up outdoors, and there is no term for the piki-house itself, except in English, although the piki house is a rather distinct architectural type.

The fact that occupancy terms can be used in conjunction with the separate and uncombined word *building*, with its array of inflected forms, to specify all sorts of places both outside and inside of given buildings, makes up for the lack of building terms, so far as fluency of expression goes. However, it seems rather queer that there should be no terms for such distinctly different shapes of buildings as e.g. the one-story building, the two-story set-back build-

ing, and the kiva; this fact has to be recorded as a peculiar datum of the language not explainable either from other patterns in the language nor from anything in the architecture or anything else in the culture.

It seems especially queer from the standpoint of our ways of thinking that there should be no name for the kiva, that structure so highly typical of pueblo culture and so intimately connected with their religion.

Many people know that our word kiva is taken from Hopi, but they think that it is the Hopi word for a kiva, which it is not.

TERMINOLOGY OF HOPI BUILDING CONSTRUCTION

Unanalyzable stems:

ʔá'pa- *interior*, ʔá'pavɛʔ *at the inside;* ʔé'ci *door*, ʔé'cpi, ʔéʔe'cpi *at the door;* ʔéci *closure, partition;* sá'qa *ladder;* té'kwa *something built of stones, but not finished building, erection of stones, unfinished wall, standing portion of a ruin;* té·wi *ledge, shelf* (natural or architectural); wéna *a timber, board, plank.*

kí·he *building, house*

Compounds with -ki: occupancy terms: hé·yaNki *store, trading post;* té·teqàyki *school.*

Locator suffixes:

kíco?o- *roof*, kicó?òvi *from the roof*, kicó?òmiq *to the roof;* yé·mok—*into another enclosure, room, closet, etc.*, yé·mokvì *far inside.*

Compounds and miscellaneous architectural terms:

kíŋa, kí·het ŋà?at *foundation* (*root of the house*); kíska *tunnel, covered way;* kí·coki *village;* kí·sonvi *plaza;* hôciwa *opening, doorway;* ké·vɛla *ceiling;* kiqálmo *eaves, cornice;* kí·qölò *lowest story of a house, cave;* lɛ́stạvi *viga, beam, roof support;* mecávki *tent;* nayávɛ *adobe;* pálwicòqa *plastering clay;* panávca *window, glass, mirror;* póksö *ventihole, chimney, window hole;* tékʷni *roofed wall, stone fence;* tekʷánmère *enclosing wall, corral.*

REVIEWS AND NOTES

Linguistic Time-Perspective and its Anthropological Uses[1]

One of the fundamental tasks of anthropology is to study, in as detailed a fashion as possible, those vast chapters of human history which the historical method, in the narrow sense of documentary interpretation, is forced to leave blank. Roughly this means the prehistory of Europe, of the Near and Middle East, and of the Far East, and the aboriginal history of the rest of the world. Ultimately it may be only the sweeping outlines of all this that need be retained on the record. But it is impossible to know in advance whether or not any given small detail will be of germinal importance in deducing those sweeping outlines, and so the anthropological historian cannot, at present, afford to discard any attainable fact, however seemingly trivial. In the absence of written records the variety of techniques for the attainment of time-perspective is enormous, overlapping the domain of the nuclear physicist (carbon-14 dating), the dendrologist (tree-rings), the climatologist, and many other specialists. The anthropological historian can master at most a few of these techniques; he must have the collaboration of many scholars in many fields of scientific endeavor.

Thus it is that the anthropological historian has a clear stake in historical linguistic study, and the linguist, whenever engaged in such study, an equally clear responsibility to the anthropological historian. We are not always aware of this responsibility, and in a given instance it may not interest us; it is none the less there, and cannot be ignored. It is with our collective performance of historical linguistics, insofar as it affords the anthropological historian grist for his mill, that the present paper deals.

The oldest of our methods for attaining time-perspective in language is of course the comparative method, which never has been and never will be superseded. For the anthropological historian a simple but often useful product of the comparative method is the definite assertion that two languages are, indeed, related; or, negatively, that two languages are not related within the time-depth to which, using the available descriptive data and the tools of the comparative method, we can penetrate. (An absolute statement of 'no relationship' is of course always impossible; two given languages might share a common ancestor a thousand or a hundred thousand years earlier in time than the earliest stage that can be reached by reconstruction.) Somewhat more complex is the conclusion that languages A and B, though both related to C, are more closely related to each other than to C; that is, that the common ancestor of A and B was spoken at a later time than the common ancestor of all three. Such relatively simple statements are on occasion so useful that we are led to ask: are such assertions ever possible on the basis of less time and labor than is required by the comparative method?

Indeed they are, and quite reliably so, in certain cases. Once we understand the meaning of genetic relationship, then there are languages so close in external appearance that judgment-by-inspection is quite enough. The Powell classification of American Indian languages north of Mexico was of just this impressionistic sort, and to date no relationship postulated by him has been controverted by more detailed study.[2] The

[1] Given at the Fourteenth Annual Summer Meeting of the Linguistic Society of America, Indiana University, August 1–2, 1952.

[2] J. W. Powell, Indian Linguistic Families of America North of Mexico (7th Annual Report of the Bureau of American Ethnology, Washington, 1891, pp. 7–142). The history of larger grouping,

trivial instance of judgment-by-inspection is that of two linguistic patterns so close that they count as dialects of a single language, whereupon the question as to genetic relationship is never even asked. But at the other end of the scale of degrees of similarity there is more trouble; those who undertake to give judgments-by-inspection will disagree, and we do not know whose judgment to accept. This is a matter that will concern us later.

A second technique for attaining linguistic time-perspective has recently been codified under the label internal reconstruction.[3] The technique is in essence quite old; in many earlier 'descriptive' grammars a kind of internal reconstruction often occupied the place now taken up by morphophonemics. Internal reconstruction is most strikingly useful when the comparative method is inapplicable, as when we have data only on one language of a family, or when a family consists of only a single language. But internal reconstruction is actually more fruitful, if less strikingly so, in those cases where it can be used in combination with the comparative method.

In the first place, internal reconstruction on some of a group of related languages may supplement external reconstruction based on comparing them all. This we can illustrate with Central Algonquian.[4] Fox and Shawnee show final short vowels in all words; corresponding words in the other languages, except for a well-defined class of shorter words, lack these vowels. But these other languages all are characterized by morphophonemic alternations which lead one, by the technique of internal reconstruction, to posit an earlier stage during which the now missing final short vowels were phonemically present. When we reconstruct PCA words with final short vowels, we do so not alone on the direct phonemic testimony of Fox and Shawnee, but also on the morphophonemic testimony of the other languages.

In the second place, when the comparative method has yielded its maximum, and we have a good characterization of a parent language, internal reconstruction applied to that parent language can often push the horizon back a bit further. The comparative method forces us to assume that in Proto-Central-Algonquian t and c were distinct phonemes. But an alternation between them, still alive in the daughter languages, makes quite clear that at some Pre-Central-Algonquian stage these two sounds were allophones of a single phoneme.

The inner chronology of a language or of a set of languages, attainable by comparison and internal reconstruction, is not in itself of much use to the anthropological historian. He is often interested, however, in loanwords. Only the full framework of inner linguistic history can serve as an adequate basis for the study of loanwords and their migration, for lacking the inner historical details it is often impossible to tell which sets of similar words are cognates and which are similar due to other reasons. The Menomini and the Ojibwa words for *pig* are quite similar, and both are obviously borrowed from French. We can tell, from our knowledge of Menomini itself, that the Menomini word is in all probability not a direct loan from French; rather the word entered Menomini via Ojibwa. It would not be too bad a further inference to say that the pig itself probably reached the Menomini via the Ojibwa, possibly before much face-to-face contact between the former and Europeans. The late stages of American aboriginal history are full of matters which could be investigated by

tentative and definite, is given in Harry Hoijer, Introduction, Linguistic Structures of Native America (Viking Fund Publications in Anthropology, No. 6, New York, 1946).

[3] Henry Hoenigswald, Sound Change and Linguistic Structure, Lg. 22.138–43 (1946).

[4] Leonard Bloomfield, Algonquian (Linguistic Structures of Native America, 85–129; see fn. 2 above); also unpublished material.

ethnolinguistic techniques of this kind—but with very little sure result unless all the hard work of historical linguistics is performed. Another concrete case well worth mentioning is the aboriginal spread of the turkey in native America, which ought to be looked into closely with an eye out for the linguistic evidence.[5]

The newest technique for the attainment of linguistic time-perspective is known as glottochronology. Credit for its discovery and first effective application goes to Morris Swadesh.[6] The validity of the procedure is still in doubt, but the possible yield is so great that extremely diligent study is imperative.

The essence of the glottochronological technique is an assumption: over relatively long periods of time, the rate of shift of items in what we may call the BASIC LEXICON of a language is approximately constant. The terms in this assumption which need sharpening are 'relatively long periods of time', 'basic lexicon', and 'approximately constant'.

We know that speakers may be placed in social situations in which they change vocabulary quite rapidly, or in other social situations in which vocabulary habits are conservative. Thus, during sufficiently short intervals, the rate of lexical replacement can be quite high or quite low. Unless such differences of rate are short-term matters which tend to smooth out over longer periods of time, the technique must be discarded. Now the assumption of such smoothing-out can be tested. There are perhaps a dozen or so languages where we have continuous evidence, in the form of written records, over periods of time as long as a thousand years or so. From the written records we can supply absolute dates for various stages of the languages; then, by making the proper counts of retained and displaced vocabulary and by applying the appropriate mathematical machinery, we can find out whether there is or is not some approximately constant rate of displacement which is valid when intervals of time of more than some statable minimum are involved.

By the basic lexicon is meant a semantically-defined stock of forms which we can be sure will be found in every human language—names of body-parts, of natural objects and processes, and so on. For purposes of statistical treatment it is desirable for the basic lexicon to be as large as possible. But when one begins to look for meanings that are universally or almost universally given lexical expression, the reliable list becomes smaller and smaller. Here, also, a great deal of experimentation is needed; if no constant rate index is obtainable from languages with recorded histories with one tentative check-list, a different check-list may yield one. Although much of the necessary experimental and checking work has already been carried out, the answers are not yet sure; more work is still needed.

On the assumption that these methodological uncertainties can be cleared up, we can discuss the uses to which glottochronological technique can validly be put.

In historical linguistics we work currently with two kinds of dating. Calendrical or METRICAL dating is possible when the proper kind of written records are at hand; thus we can with fair certainty describe the English speech-habits of 950 A.D., and state the changes that have taken place in the thousand years since that time. TOPOLOGICAL dating involves nothing more than the notions of 'before' and 'after.' Topological

[5] This suggestion emerged in discussions between Mary Haas and the writer; the word for *turkey* in one of the southeastern languages with which Dr. Haas has worked is suspiciously similar to one of the Algonquian names for a larger bird.

[6] Salish Internal Relationships, IJAL 16.157–67 (1950). An interesting foreshadowing (which in no way detracts from the credit due Swadesh) will be found in Pliny Earl Chase, Remarks on the Mathematical Probability of Accidental Linguistic Resemblances, Transactions of the American Philosophical Society (volume unknown), pp. 25–72, read September 18, 1863.

dating can often be supplied on the basis of the comparative method and internal reconstruction, and for some inner chronological details is the only kind of dating possible even for languages where good written records are available. Examples of topological dating are the following: Language C was effectively separated from the common ancestor of languages A and B before the latter two became effectively separated. In Menomini the loss of the final short vowels of PCA preceded the development of the quotative mode of verbs.

Now glottochronology is a further technique for achieving a kind of dating, but the kind which it will give us, if we eventually conclude that the technique is trustworthy at all, is neither metrical dating nor topological dating; it is a third kind, PROBABILISTIC dating.

Suppose that glottochronological procedures have been applied to a group of languages, A, B, C, D, for which the common ancestor has already been reconstructed by more conventional techniques. The result, stated in words, may be something on the following order: 'the parent language of A, B, C, and D was being spoken about 500 A.D., plus or minus 600 years.' This does NOT say that the parent language was being spoken about 500 A.D. It does NOT say that the parent language was being spoken throughout the period from 100 B.C. through 1100 A.D. What is said, rather, is that the parent language was MOST PROBABLY being spoken about 500 A.D., less probably (but perfectly possibly) a hundred or so years before or after that date, and with vanishingly small probability as early as 100 B.C. or 1100 A.D.

Now, of course, if we believe in our traditional historical techniques, if we do not conceive of comparative linguistics simply as a game that has nothing to do with the actual past history of languages, then the parent language a picture of which we are able to achieve via the comparative method was spoken by certain people over a certain interval of time and over a certain region. We do not assume that there is any indeterminacy in the historical facts themselves. The probabilistic terminology is only a measure of the degree of accuracy of our techniques of time-perspective. It has been said that 'when speaking of the past, possibility and certainty are equivalent concepts, while probability is but the measure of our ignorance'. This is a hard word, but a wise one. It can be shown that almost all of our understanding of the past must really be cast in probabilistic terms, and must be so thought of and manipulated. That is, both topological dating and metrical dating are, in effect, but special cases of probabilistic dating. We need several examples to show this.

Whenever we state a conclusion in terms of topological dating, all we mean is that the present state of affairs is more easily understood if the given relative chronology is assumed rather than some other. We do not know for certain that the Menomini quotative mode was developed after the loss of final short vowels; this simply seems to fit the presently observable facts better than the contrary assumption. In some cases we overtly include the word 'probably', or the expression 'it seems likely that' in a statement of relative chronology; in some cases we are even more hesitant. The probabilistic factor in such thinking is not a quantified probability, but it is none the less real.

When we reconstruct, say, Proto-Germanic, and list, among other correspondences, that between English *man* and German *Mann*, we do not mean that we know for certain that the speakers of Proto-Germanic actually used a word which has come down into English as the former and into German as the latter. If there are a thousand listed cognates, all that we mean is that some high percentage of the reconstructed parent forms were actually current in the speech of our Proto-Germanic linguistic ancestors. If that percentage is, let us say, eighty, then all that we can say

about the reconstructed prototype of *man* and *Mann* is that the probability that it was actually used by speakers of Proto-Germanic is .80.

Even calendrical dating, metrical dating, is a special case of probabilistic dating. A probabilistically given date, such as the kind possibly obtainable via glottochronology, can be displayed best as a probability curve along a time axis, as shown in figure 1.

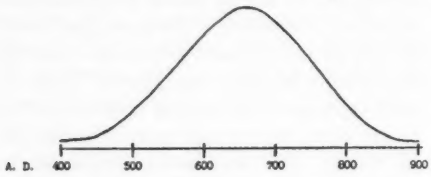


FIG. 1

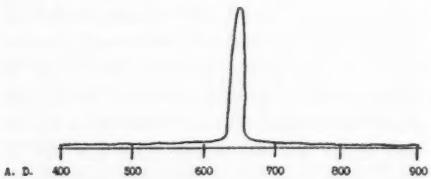


FIG. 2

In the same fashion, a calendrical date can be portrayed as the same sort of bell-shaped curve, but with very steep slopes to either slopes to either side of the maximum, as shown in figure 2.

Glottochronology, through mathematical necessity, is going to yield at best only probabilistic dates with relatively spread-out curves. For intervals of time that are too brief, the indeterminacy of varying rates of basic vocabulary displacement comes into play, so that the procedure is useless. For intervals of time that are somewhat longer, we may hope that the results will be good. But the further back in time we attempt to go, the lower will be the peak and the more gentle will be the slopes on either side. For sufficiently long intervals, the curve will approach so nearly a straight line that the resulting relativistic dating once again is quite worthless to us.

At best, glottochronology will have one and only one valid sphere of application. When a group of languages have been subjected to the procedures of the comparative method and the common ancestor has been reconstructed, then the techniques of glottochronology may afford probabilistic dating of the common ancestor; where, as for American Indian languages, no other kind of dating is available save only that of 'before' and 'after,' this is a highly valuable yield.

In a number of articles and orally presented papers since his first one on glottochronology (see fn. 6 above), Swadesh has lost sight of the rigid limitations and elaborate controls necessary for reliable results.[7] This is most unfortunate if for no other reason than that it tends to discredit wholly a technique for which—given proper controls—there may be much use. There are three sources of error in Swadesh's more recent contributions. The most general source is a total misunderstanding of the nature of probabilistic thinking; it is in part for this reason that the rather detailed discussion which has just been concluded was incorporated into the present paper. The second is that the original basic lexical check-list, used in the first article, has been abandoned; in some cases the list of items not only goes outside what could by the wildest stretch of the imagination be counted

[7] With Gordon Marsh, Kleinschmidt Centennial V: Eskimo Aleut Correspondences, IJAL 17.209–16 (1951), particularly section 1.2; review of Shafer, Athapaskan and Sino-Tibetan, IJAL 18.178–80 (1952); paper given at the Annual Meeting of the LSA in New York, December 1951. Some of the least reliable of Swadesh's speculations have not yet appeared in print or even been given as oral presentations, which is commendable; the present paper is expressly intended to forestall, if possible, the appearance in print of anything else as loose and dangerous as the review of Shafer listed above.

as 'basic lexicon', but also is far too small for valid mathematical treatment. The third is that Swadesh has been attempting to apply the technique, not for determining dates of a sort in a set of languages known to be related, but for dating, and perhaps almost as evidence for the relationship of, languages which are by no means known to be related. The results are dangerously close to those worked out by a Dennison[8] or a Sherwin.[9]

To Swadesh's credit it must be stated that in doing the sort of thing he has been doing he has not chosen languages completely at random; he has been guided by the suspicions of distant relationship expressed some years ago by Edward Sapir. This brings us back to a question posed earlier, in the discussion of judgment-by-inspection: how dissimilar must languages be before judgment-by-inspection is of no value? Part of the answer to this depends on who is doing the inspecting. There is no question but that Sapir's deep feeling for how languages work, and for differences and similarities as to how they work, rendered his judgments-by-inspection worthy of much more respect than those given by a Dennison, a Sherwin, or even a Rivet.

In surveying the native languages of North America, Sapir thus rendered a service to his fellow students of those languages. When the reconstruction of Proto-Algonquian has been completed, then it will be right and proper for us to turn next, not at random to Siouan or Iroquois or Eskimo or Uto-Aztecan, in the search for possible more remote congenors, but to Kutenai and Salishan. Sapir's guess might, of course, not be vindicated, but it still serves as the best sign post we have.

Sad to relate, however, in performing this service for his fellow linguists Sapir rendered a major disservice for the unwary anthropological historian. The latter individual, as was pointed out in the beginning of this paper, cannot master all the varied techniques of time-perspective; he must rely on specialists, and is understandably impatient of laborious detail in a specialty which he himself has not mastered. In his eagerness to get at longer-term sweeping outlines, he is all too apt to grasp uncritically at broad quasi-genetic classifications such as Sapir's, trusting them because he has good reason to trust the scholar who supplied them.

Thirty years' experience with anthropological historians who have accepted Sapir's classification uncritically should warn us of our responsibility. The same individuals, or their successors, will grasp in a similarly uncritical way at the totally unfounded results which Swadesh has been announcing or supporting, or, for example, at the new and better worked-out classification of Australian languages recently proposed by Joseph Greenberg.[10]

The anthropological historian is performing a task of fundamental human importance: it is but befitting to the dignity of the human race that it should know as much of its own past as possible. Our responsibility, therefore, is to supply him only with the best we can. Taken as speculation, as preliminary trial-and-error testing, all or almost all of Swadesh's recent reports have a valid place. But we must find some way of distinguishing more clearly, both for ourselves and, especially, for the anthropological historian, between methodological discus-

[8] Dennison (or Denison), Mexican Linguistics (initials, date and place of publication, not available to me). This is the book which attempts to demonstrate the Indo-European affinity of Aztec, citing such similar forms as Aztec atlan *water*, Greek atlantikós *of Atlas, Atlantic.*

[9] Reider T. Sherwin, The Viking and the Red Man. 6 vols.; vols. 1 and 2, Funk and Wagnalls Company, New York and London (1940, 1942); vols. 3–6, R. T. Sherwin, Bronxville (1944, 1946, 1948, 1950). This is the book which attempts to demonstrate the Old Norse source of the Algonquian languages.

[10] In his paper delivered to the Annual Meeting of the LSA, December, 1951.

sion and experimentation on the one hand, and filled-in historical detail of some statable degree of reliability on the other; and we must make sure that the anthropological historian is supplied only with the latter. If we insist on this, many an anthropological historian will be impatient with us, since what he usually wants is long-term broadly general results in capsule form. But so important is his own work that he deserves better than he sometimes seems to ask. Collectively, we must emphasize to the anthropological historian that if all the evidence on which he bases his deductions is as unreliable as some of the linguistic pseudo-evidence which up to the present he has been handed, then his whole picture of human history is a house of cards that will collapse in the slightest breeze of methodological rigor.

CHARLES F. HOCKETT
CORNELL UNIVERSITY

COMMENT ON HOCKETT'S CRITIQUE

In the foregoing paper Charles F. Hockett presents an interesting and welcome discussion of linguistic time perspective and the lexico-statistical approach. I believe that I agree essentially with his position but not without reservations, since it seems to me he has more than once overstated specific points. Let me mention the following.

1. Hockett attributes to me 'a total misunderstanding of the nature of probabilistic thinking,' but he does not give any quotations from my papers bearing out the characterization. Since 'probabilism' in different degrees applies to all scientific study, what is needed for lexico-statistics is not so much a generalized declaration but a detailed analysis of uncertainties and a calculation of probabilities. These I give insofar as I can in Lexico-Statistic Dating of Prehistoric Ethnic Contacts (Proceedings of the American Philosophical Society vol. 96, pp. 452–463, 1952). This work had not appeared at the time Hockett wrote his paper.

2. Hockett strongly criticizes the basic vocabulary test list I have used. I too recognize weaknesses in it, and in PAPS 96.456–7 suggest an objective procedure for strengthening it. However, even in its present composition the test vocabulary gives tentatively usable results. Quantitatively Hockett states that the list is 'far too small for valid mathematical treatment.' Certainly a list about twice as large would be mathematically better, but Hockett has given no demonstration of mathematical invalidity of the present size of list.

3. Hockett declares that lexical statistics cannot be applied before an ancestor language has been reconstructed. The meaning of this stricture is not clear, since, as is known, no prehistoric language can be reconstructed with absolute completeness. Furthermore, the reconstruction is normally not produced at one fell swoop but by a series of partial hypotheses, each of which must be checked with the material. The test of a reconstructive hypothesis is both qualitative and quantitative; the separate details must not be mutually contradictory and one must find, for each correspondence, a sufficient number of supporting examples to eliminate the factor of chance. This being the case, it follows that lexical statistics may be used to help demonstrate a genetic relationship and need not be reserved only for use as a post-reconstructional exercise. The possibilities of systematic quantitative proof of genetic relationship by means of lexical statistics are discussed in my recent article, Mosan I: A Problem of Remote Common Origin (IJAL 19.26–44).

4. Hockett characterizes my lexico-statistic papers as undocumented. This flat characterization disregards the inclusion of the test-list with score in Eskimo Aleut Correspondences by Gordon Marsh and myself (IJAL 17.209–216, 1951) and of footnote references in three other articles. The documentation for my Tlingit-Athapaskan cognate count, which Hockett is presumably referring to when he complains of the article on Athapaskan and Sino-Tibetan (IJAL

18.178–181), is given in abbreviated but essentially complete form in Southwestern Journal of Anthropology 7.14, fn. 13, 1951; the latter article is cited in a footnote to the former article. The Mosan paper, referred to before, and others still in press carry full documentation.

MORRIS SWADESH
NEW YORK CITY

MAYA HIEROGLYPHIC WRITING: A REJOINDER

In writing a review one should know something about the subject under discussion and should have read the book with some care. Dr. Hill in his review of my book Maya Hieroglyphic Writing: Introduction (IJAL 18: 184–86) obviously fails in both respects. As example of his ignorance of the subject: he describes Roys and Gates as primarily archaeologists, although neither has done any archaeological work—Roys is the greatest authority on the Yucatec language and Gates confined himself almost entirely to problems of language; he incorrectly classifies Tozzer as an epigraphist; and he suggests that a statistical approach might solve the order of reading glyphs. That problem was solved over fifty years ago and, indeed, has been the very first thing taught beginners in the field for as many years.

That Dr. Hill has not really read the book he purports to review is more evident and a more serious matter. He contrasts my supposed approach of attacking glyphs separately with Whorf's sentence approach. If he had read my book (e.g. pp. 264, 266, 270, 273 etc.) he would have seen that I have attempted translations of passages of some length, certainly of greater length than did Whorf, but only after a glyph-by-glyph discussion. Also I did what Whorf did not do; wherever possible I tested the proposed translations of elements in other contexts. Moreover I suggest the grammatical scheme of the divination clauses—verbal noun, subject, object, and indirect object (result). The translations are not exhaustive, since the book is, as labeled, an introduction, and is to be followed by other volumes with the same title.

Dr. Hill notwithstanding, I have demonstrated in new decipherments that compound glyphs, in some cases, at least, represent compound words and that glyphic affixes frequently correspond to speech affixes (e.g. compound glyphs for kintunyaabil *drought*, p. 269; Bolonyocte p. 56; chac zac cimil *great fainting*, p. 252, yaxte *the ceiba*, p. 56, ahaulil *rulership*, p. 269 etc.). Dr. Hill is interested as to whether affixes are determinants. In my book he will find full evidence (summarized pp. 41, 290–91) that affixes can be adjectives, numerical classifiers, prepositions, relationship terms, attributive elements, restrictive elements, and sometimes nouns. Furthermore, affix and main element can change places without change of meaning. There is no present evidence that they serve as determinants in Whorf's sense of the word.

Dr. Hill feels that he is more at home when faced with Whorf's ideas on decipherment. When a colleague read my manuscript, he remarked of the discussion of Whorf's methods "Why flog that dead horse? There can't be a person who takes seriously Whorf's fantastic work." Apparently he was wrong; Dr. Hill does. Acting on that remark, I cut the appendix on Whorf but I retained the analysis of one of the two translations of clauses which Whorf gave as samples of his method. This showed that of the five glyphic elements in the clause Whorf had misidentified four, and of the two Maya words he derived therefrom one did not have the meaning he ascribed to it, and the other probably would not be used by the Maya in the sense he gave it. If one can get a two-word sentence by misreading four of the five glyphic elements and by dubious use of the resulting words surely this chance result demonstrates the method is wrong and the translation incorrect. Yet this demonstration is labeled by Dr. Hill as 'mere obscurantism.' Do linguists really

need a more detailed demolition? After all he has been severely criticized by Long and Andrews, and no one has defended his approach. Whorf's excursion into this field which was not his own was most unfortunate—scholars frequently come croppers when they do this. My discussion of Whorf's approach occupies three of the 363 pages of the book. Surely, Dr. Hill shows some emotionalism in his remarks.

There is certainly an important place for the trained linguist in the field of Maya decipherment, but there is also need of what Dr. Hill calls the semi-romantic approach, by which he apparently means a partial dependence on ethnology and mythology for translation. One cannot translate all glyphs into modern Yucatec because many of them are ideographic and in many cases the corresponding archaic term is now lost (e.g. my very good tidings glyph [p. 268] where the ox element is clearly an augmentative, but an oc root appears to have dropped out of use in the restricted sense of good omen in all Maya languages, of which there are adequate dictionaries). Let me give three examples from my book of untranslatable compounds. The glyph compound for drilling fire may have a dog's head added. Maya terms for dog have no resemblance to the word for fire. Here the dog's head is ideographic, for Maya mythology tells us the dog brought fire to mankind; it cannot be transiated. Again, the glyph of the sun in the underworld has affixes or infixes representing shells, maize, or the color black. The linguist will get nowhere if he tries to translate these; they are symbols of the underworld added to indicate that the sun god is traveling at night through the nether regions. Maya terms for west in all lowland Maya languages and dialects mean *sunset* (*sun enters* [*the earth*], or *sun lowers*, etc.), but the glyph shows a hand over the sun glyph, *completion of sun*, an expression nowhere used in the spoken language. The glyph is ideographic, not phonetic.

I was able to decipher the glyph for *count* with adverbial and prepositional affixes indicating backward, forward, and the locative ti. The Yucatec term for *count* is xoc. The main element corresponding to *count* is a highly conventionalized fish, and is clearly a rebus since there is an obscure mythological fish deity called xoc. The 'semi-romantic' approach was necessary to get that identification, but the case goes farther. In Maya glyphs an attribute can replace a personified element. In this compound the jade glyph, which also stands for water, very frequently substitutes for the xoc *fish* (there are scores of these glyphs in the inscriptions following additions or subtractions). This substitution is presumably because water is the god's attribute, as it is the element in which a fish lives. If the linguist tries to read this central element as ha *water*, or tun etc., *jade*, he will get nowhere, or, worse still, get where Whorf got.

Where such matters have to be discussed one must, perforce, be discursive. I regret that Dr. Hill was so bogged down that he entirely missed the main contribution in the book especially as he had been warned (p. 35) that such discussion was a necessary preliminary to decipherment. He criticizes me for presenting only isolated glyphs in the illustrations. For his information I would note that over a third of the plates give complete texts or clauses and nothing else, and on other plates there are shorter clauses mixed with single glyphs. The inability to distinguish single glyphs from sentences might deter some people from undertaking a review of this book.

J. Eric S. Thompson
Carnegie Institution of Washington

Cheyenne Grammar. By Rodolphe Petter. Newton, Kansas: Mennonite Publication Office, 1952. 126 + 70 pp.

This grammatical sketch, now offered in mimeographed form with a hard binding, represents more than twenty-five years of painstaking effort on the part of Petter, a

Swiss Mennonite missionary, who lived and worked with the Cheyennes for half a century. Other works by Petter include a voluminous English-Cheyenne dictionary,[1] translated portions of the Bible,[2] a short sketch of Cheyenne grammer,[3] and various manuscripts to be found in the Edward E. Ayer collection and in the Bureau of American Ethnology. Beginning as a teacher at the Cantonment, Oklahoma Mission School among the Southern Cheyennes around the turn of the century, Petter devoted a lifetime to the study of Cheyenne, preaching and translating the Bible. At the time of his death in 1947, he was pastor of the Mennonite Church in Lame Deer, Montana, centrally located on the Cheyenne reservation.

The author states, 'I was careful not to mold the grammar after preconceived ideas, but to let it naturally evolve from the language itself. . . .' (Introd.). In spite of this statement, this sketch has a considerable tinge of the Latin model so characteristic of the days preceding Bulletin 40 of the Bureau of American Ethnology. A concluding note at the end of the volume dated May 6, 1909, Cantonment, Oklahoma, is followed by two postscripts: 'Revised and copied in 1926–27, Lame Deer, Montana (presumably referring to the first 126 pages), and 'Addenda written and finished July 8, 1944, Lame Deer, Montana' (referring to the last 70 pages). Since most of his grammatical material was prepared during the first quarter of the present century, it is not surprising to find that Petter worked without the benefit of the phonemic technique and the structural method. His material does, however, have the advantage of his long residence with the Cheyennes and probably constant practical use of the language.

The orthographical system devised by Petter seems to have presented a real problem to Cheyenne speakers; very few have ever learned to utilize it. The usual comment I hear in Oklahoma is that Petter's Bible translations must be written in Northern Cheyenne, for the Southern Cheyennes (although literate in English) cannot read them. In Montana, Cheyenne speakers commented to the effect that many have tried to learn to read Cheyenne, but only a few have ever been successful.

At the moment I can envisage only one use of this grammar as it now stands: it might serve as an aid in the identification of morphemes. Once the orthographical system is clarified, a field worker could probably use the grammatical material to shorten his task in singling out the morphemes of the language (a sizeable undertaking for any field worker). Although many of the grammatical categories are obscured by the mode of presentation, the devices of arrangement immediately identifiable are quite similar to those of Central Algonquian.[4] On the other hand, Algonquian cognates in Cheyenne appear to be very few.

The present writer gathered some Cheyenne field data in Oklahoma and Montana during the summers of 1948 and 1949. Northern Cheyenne and Southern Cheyenne were found to be so nearly identical, that a study of only one seemed indicated. The principal difference between the two dialects is one of usage: certain vocabulary items are employed in one but absent in the other. The only structural difference observed was the presence of the phoneme č in Northern Cheyenne, but absent in the speech of a number of Southern Cheyennes, including my main informant in Oklahoma.

According to my tentative phonemicization, there are fourteen consonants and three vowels: p, t, k, ?, c, č, s, š, x, h, m, n,

[1] Kettle Falls, Washington, Printed on Gammeter Multigraph by V. Petter, 1915.

[2] Maheo henitae-histanovestoz zeoxtoese-hesetovaomohettoz' vovoe-histanova na Maheonoxtoenoe-manhastova. The Kingdom of God. Lame Deer, Montana: Printed on Gammeter Multigraph by E. M. Cheyenne (1926). Nivova-pavhostō. The Four Gospels. Lame Deer, Montana, 1928.

[3] Memoirs, AAA, Vol. 1, pt. 6 (1907), 443–478.

[4] Bloomfield, Leonard. Algonquian. VFPA 6.85–129, 1946.

w, y, i, o, and a.[5] In terms of Petter's transcription these are usually represented as follows:

/p/, p and b; /t/, t and d; /k/, k, g, and q; /ʔ/, v̀, when recorded (unrecorded in most positions); /c/, z; /č/, c; /s/, s; /š/, š; /x/, x; /h/, h; /m/, m; /n/, n; /w/, v; /y/, y; /i/, i, e, ē, e̊, '; /o/, o, ō, o̊, '; /a/, a, ā, å, '.

Less conventional symbolizations employed by Petter are: v̀ representing /vh/ and /v̀hv̀/, and â, ô, ä representing /ao/, /oi/, and /ai/ respectively.

Consonants /p/, /t/, /c/, /č/, /k/, /ʔ/, /s/, /š/, /x/, and /h/ are voiceless. The stops are unaspirated; the lack of aspiration probably accounts for Petter's transcriptions b, d, and g in some instances. Consonants /m/, /n/, /w/, /y/ and vowels /i/, /o/, /a/ have both voiced and voiceless allophones. Petter indicated some voiceless vowels with diacritic marks, but in most cases voiceless vowels are simply unrecorded in his material.

I believe a thoroughgoing study of the suprasegmental phonemes of Cheyenne must be made before the morphology can be worked out accurately. Most affixes are comprised of morpheme alternants in the composition of which at least one segmental phoneme figures, but, to my ear, certain alternants of morphemes denoting plural number of nouns, location, and some other grammatical ideas, are simply pitch changes.

For the purpose of recording texts, I adopted the practice or marking three levels of pitch, which to me seemed concomitant with stress. Unstressed syllables were left unmarked. It was soon found that single vowels were voiceless in phrase final (i.e. before pauses) and in phrase initial and medial preceded by a consonant other than /h/ and followed by /s/, /š/, /x/, or a cluster with /h/ as the prior member. In turn, only voiceless consonants appeared before voiceless vowels.

I am under no illusion that there are three pitch phonemes in Cheyenne. The patterns appear to be too limited for that conclusion. I think there is probably considerable regularity in the segmental area, the key to which, at the time of this writing, has not been found.

The missionaries continuing Petter's work in Montana would do well, I think, to examine this problem in the light of recent developments in the treatment of suprasegmental phonemes. On the whole, a closer approximation to phonemic writing would probably provide a better means for literacy activities among the Cheyennes. Many ethnophonemic writing systems for American Indian languages are used with considerable success, but Petter's transcription appears to be too far removed from phonemic writing to be efficient.

KENNETH CROFT
INTERNATIONAL INFORMATION ADMINISTRATION
DEPARTMENT OF STATE

EL IDIOMA GUARANÍ. GRAMÁTICA, LECTURAS, VOCABOLARIO DOBLE. By Father Antonio Guasch, S. J. 2nd ed. Ediciones del Autor, Sarandí, 65, Buenos Aires, 1948. 548 pp.

DICCIONARIO GUARANÍ. PRECEDIDO DE UNA SÍNTESIS GRAMATICAL Y DE LA FAUNA Y FLORA GUARANÍTICAS. By Father Antonio Guasch, S. J. 3rd ed. Ediciones del Autor, Sarandí 65, Buenos Aires, 1948. 662 pp.

Although Father Guasch's two publications do not in themselves constitute a modern structural statement, they yield sufficient consistent material to attempt at least a structural restatement of the phoneme pattern of Guaraní.

The volume on grammar is divided into two parts: Morphology (which also contains the chapter on the sound pattern; pp. 9–123), and Syntax (pp. 127–247). These are followed by fifty pages of reading matter (pp. 250–300) and a Guaraní-Spanish, Spanish-Guaraní dictionary. Appended are

[5] For a somewhat different interpretation of Cheyenne phonemes and a list of examples, see Smith, William B. S. Some Cheyenne Forms. SIL 7.77–85, 1949.

six photos showing two charming youngsters articulating various Guaraní sounds, and maps of Paraguay and Asunción with environs. In addition to a detailed table of contents, the volume boasts equally detailed name and subject indices which add to its usefulness.

The treatment of the sound pattern is in the form of rules for the pronunciation of the orthography accepted by the Cultura Guaraní literary society, which—with some minor modifications—is used by the author. This spelling system, though it violates the principle of 'one letter per phoneme, one phoneme per letter' in some important respects, is on the whole adequate to serve as a basis for phonemic description. The author's phonetic data are likewise sufficient for a brief treatment of the major allophones. They include a discussion of the use of accent marks which by implication constitutes a statement of phonemic stress; a particularly welcome feature of Father Guasch's work, since this aspect of the description is most often neglected by our Latin American colleagues.

Unfortunately, Spanish conventional spelling is used for the fairly frequent loans, which makes it impossible to determine to what extent they have been assimilated into the Guaraní phonemic pattern.

The morphology is presented in the traditional manner of comparing it to a well-known language, in this case Spanish. In essence, Guaraní translations of the traditional Spanish grammatical categories are given. This is particularly evident in the discussion of Spanish categories that have no equivalent in Guaraní, such as the article or grammatical gender. On the other hand, Guaraní distinctions that have no Spanish equivalent—such as the inclusive and exclusive first persons plural—are carefully noted and morphophonemic variations are described in some detail. The treatment of the syntax is confused by the difficulties of the morphology-syntax division, and is rather difficult to follow.

The readings include conversational materials and sample letters, but are rather heavily weighted on the side of religious topics. This, incidentally, also applies to the examples used throughout the book. Whereas this may be out of proportion with the distribution of topics in the speech of the average Guaraní, it may well turn out to be useful in comparisons with some of the early missionary material in Língua Geral. A more serious criticism of this choice of topics is the very solemn style of the reading matter, which is reflected by the Spanish translations. The vocabulary is a somewhat abridged version of the body of the second item under review.

Father Guasch's dictionary is not too extensive as to the number of entries, but is very well conceived and executed. It meets the most advanced criteria for lexicography not only by clear glossing, but also by giving, for a large number of entries, sample phrases illustrating usage, and in the Spanish-Guaraní part, by giving literal translations of Guaraní forms where this helps to clarify usage. Father Guash also has a rather modern approach to alphabetization: verb entries, in which the stem is always preceded by a paradigmatic prefix or particle, are listed under the first letter of the stem, with the preceding prefix or particle appearing in parentheses; e.g., '(a)myí: moverse', alphabetized under m.

The body of the dictionary is preceded by a very brief grammatical outline (pp. 7–23) and word lists covering fauna, flora, and parts of the human and animal body (pp. 23–36). The same appendices as appear in the grammar are included here.

On the basis of Father Guash's two books (abbreviated G, Grammar, and D, Dictionary), the Guaraní phoneme pattern appears to be as follows.

VOWELS. Guaraní has six oral vowels: a, e, o, i, ɨ, u; to these correspond six nasal vowels: ą, ę, ǫ, į, ɨ̨, ų. The oral vowels, a, e, o, i, u appear to be close to, or identical with, the five cardinal vowels; 'se pronun-

cian como en castellano' (G 9). Nasal ą, ę, ǫ, į, ų have the same qualities, plus nasalization. ĩ and ỹ are unrounded high back vowels, oral and nasal respectively. Though not much phonetic detail is given, Father Guash does state that nasal vowels are, on the whole, pronounced with somewhat greater intensity than their oral equivalents (G 17).

With the exception of ę, limited to medial and final positions only, all vowels have been found singly in initial, medial, and final positions, both under the stress and unstressed.

a (añó *solo*, D 51; hapĩkuévo *hacia atrás*, D 100; tĩpĩšá *escoba*, D 307); e (ežápo *haz*, D 88; upépe *ahí, allí*, D 310; ba?é *cosa, propiedad*, D 138); o (opĩvo *de pié*, D 222; še ahĩ?opą?ą *atragantarse*, D 45; ba?enípo *no sé, ¿quién sabe?*, D 140); ĩ (iba?é *es suyo, su cosa*, D 126; a hepidĩi *limpiarse el trasero después de evacuar*, D 111; a mošįšĩ *mimar, acariciar*, D 172); ĩ (ĩvága *cielo (de los bienaventuras)*, D 319; tebirepikué *dinero* D 292; abataví *engañar*, D 153); u (úva *muslo*, D 311; a žuká *matar*, D 345; añebovú *evanecerse*, D 473); ą (ąguí *cerca*, D 45; añąkąsé *asomar la cabeza*, D 195; pǫká *raro, esporádico*, D 238); ę (ai pęhę?á *partir*, D 229; a mopę *romper, fracturar*, D 183); ǫ (ǫvętá *ventana*, D 223; ai pǫkążorá *desliar, destejer, destrenzar*, D 238; moñemĩrǫ *ofender*, D 181); į (įtá *concha*, D 127; sį?ǫ *queja, quejumbroso*, D 86; a mopǫtí *limpiar*, D 183); ỹ (ỹmora?e *ojalá no*, D 316; a ñemǫkỹrỹisé *querer que le hagan coquillas*, D 210; a ñenopore?ỹ *ausentarse*, D 213); ų (ųrę *malestar del estomago*, D 310; ĩrųpę *cedazo*, D 318; įrų *compañero*, D 127).

Vowels occur quite freely in clusters of two and three, in which cases unstressed i, ĩ and u lose their syllabicity. There are many minimum pairs showing contrast of vowel cluster versus vowels separated by glottal stops: kuá ('una sílaba' [*kwa*]) *agujero* G 20, ku?á *cintura* G 437; sevói [sevóy] *cebolla* G 20, sevo?í *lombriz* G 390, voí [voʸí] *luego* G 20; muą *luciérnaga* G 357, mu?ą *casi* G 357.

A rather careful check of the Guaraní-Spanish part of the dictionary yielded fifty different two-vowel clusters, of these twenty-eight consisted of two oral vowels, six consisted of oral vowel followed by nasal, twelve of nasal followed by oral, and four of two nasal vowels. Thirteen three-vowel clusters were found, and one cluster of four vowels (two of which were geminate). Geminate vowels are aa, oo, uu, and among the nasals ęę—found in a single morpheme pęę *vosotros* G 58 and its combinations (in which ęę also occurs as part of the three-vowel cluster ęęi). All examples of geminate vowels were limited to medial position.

Prosodic Features. From Father Guasch's data, only stress can be said to play a part in the Guaraní phonemic pattern (G 19–20). It appears to be partially fixed and hence has to be considered phonemic, though with low functional yield.

Conditions under which stress is fixed are the following:

(1) The last nasal vowel of a word is stressed, as in hąguą *para* G 17, osę *sale* G 17, akąhątą *testarudo* G 17.

(2) The vowel following a glottal stop (final or penultimate) is stressed, as in pĩa?é *pronto* G 17, ąką?ó *degüello* G 17, pỹ?ỹi *frecuentemente* G 17.

In other distributions, stress may fall on any of the vowels in the word, the preferred positions being final and penultimate: arožá *acarrear* D 355, amodá *hurtar* D 508, daipóri *ho hay* G 17, aháne *iré* G 17, oguąhęta *va a llegar* G 17, žáparamo *por añadidura* D 324, gárata *barco* D 89.

In accordance with Spanish orthographic practice, Father Guasch does not mark penultimate stress.

Consonants. Guaraní has three voiceless stops: p, t, k; three voiced stops: b, d, g; two voiceless spirants: s, š; two voiced spirants: v, ž; three nasals: m, n, ñ; glottal stop? and glottal spirant h; liquids r and l.

Voiceless stops are voiceless lenis [p, t, k] throughout: popía *aguijón* D 241, tatanpá *fogón* D 287, kokuehevé *hace unos días* D 73.

The voiced stops b and d are prenasalized

throughout [ᵐb, ⁿd]; g is by Father Guasch occasionally written with a preceding n, but not with sufficient consistency to allow a statement about prenasalization: bokažatî *cocotal* D 145, añebïasî *condolerse* D 419, dižavîi *se parece* D 191, kadú *bulto, protuberancia* D 67, gïraú *tordo* D 94, megụá *defectuoso* D 166; but note: pj̈tąngî *medio colorado, rosado* D 259, pehengué *pedazo, fragmento, casco, tiesto* D 229.

The liquid r is single-flap: rusú *joven* D 275, ma?ẹ́ra *listo, servido* D 134.

Other consonants present no unusual phonetic features.

The glottal stop is found only in medial position; other consonants are found in both initial and medial, but not in final: gua?ú *de broma* D 92, iba?é *es suyo, su cosa* D 126, saižú *amarillo, descolorido, pálido* D 278, ïsó *gusano* D 318, šjšį *mimo, caricia* D 86, vevúi *liviano, ligero* D 313, žegueží *bajada,* D 331, mamópa ¿*dénde*? D 135, nabí *oreja* D 189, tiní *bochornoso, caliente* D 300, ñemíme *ocultamente, a escondidas* D 208, kuñá *mujer* D 81, hïpï?ụ́hape *donde está espeso, espesura* D 124. For additional examples, see above.

l appears to have very limited distribution; only four entries appear under 'L' in the dictionary, all of which seem to be Spanish loans, such as láža *clase* D 133.

Only a few consonant clusters were found. In addition to a possible ng, discussed above, nt was found in the single morpheme nte *solamente* D 193 and its composita ntéko *solamente* D 193, upéante *eso sólo* D 193, šénteko *yo sólo* D 193; nh was found in a single example a lonheá *raspar el pelo de un cuero* D 98, where the l points towards special phonemic status; rh was likewise found in a single example arhél *antipático, fuera de lugar* D 58 which contains l in final position; sm was found in . . . nemopásmone upéva . . . *que te producirá tétano* D 64. As can be seen, Father Guasch's material permits no conclusion as to the interpretation of consonant clusters.

As a general conclusion, it may be ventured that, both in terms of positions of occurrence and in terms of combinatory possibilities, vowels have a comparatively much higher functional yield than consonants in Guaraní.

PAUL L. GARVIN
GEORGETOWN UNIVERSITY

BIBLIOGRAPHIE DES LANGUES AYMARÁ ET KIČUA. Vol. I (1540–1875). By Paul Rivet and Georges de Créqui-Montfort. Paris: Travaux et Mémoires de l'Institut d'Ethnologie 51, 1951. Pp. XLII + 501, 3 maps.

Clearly a labor of love, this magnificent work was more than forty years in the making. It intends to be exhaustive and thus to include all documents relative to two of the four languages of the Inca empire—Pukina, Mochica, Aymara, and Quechua—which the compilers consider to have been the principal ones. Entries are given irrespective of quality or merit, though items considered to be worthless are so noted in brief critical estimates. As to content, the entries are not rigidly limited to linguistic ones in the technical sense, for they include travel accounts, ethnographic and archeological studies, toponymic works, bibliographies, and the like. Sources comprise manuscripts, books, and periodical articles. Items personally examined are distinguished from those known only second-hand.

The framework is chronological and, within a given year, alphabetic. But this bibliography is not at all a mere list, for there is a complicated organic interrelationship between its various parts, held together by a web of cross-referencing which a general index, yet to be published, should help unravel. It is also a sort of crude chrestomathy, since not a few documents are reproduced in Aymara or Quechua or both (and, occasionally, even in Guarani), with Spanish translations.

This first volume covers a little over three and a quarter centuries, from the Spanish Conquest through 1875. Of the total of 485 entries, only a dozen fall into the 16th century, and well over a half into the first three

quarters of the 19th. Only about one tenth of the 485 entries is devoted to Aymara alone, roughly one fourth to Aymara and Quechua together, and thus by far the greatest bulk to Quechua alone.

An idea of the scope of the research involved in the preparation of this bibliography may be gained from a rapid count indicating that about two hundred libraries, located in twenty lands, in which the items listed are on deposit, have been consulted.

The juxtaposition of Aymara with Quechua in these pages implies nothing as to the kind of linguistic relationship between them. The authors deliberately avoid speculating as to their genetic connections, if any. They are prudent to realize that the problem —a rather delicate one in view of the considerable Inca influence upon Aymara culture from about 1430 onwards—cannot be solved by inspection, on the basis of which Harrington and others have argued. Instead, the comparative method will have to be painstakingly applied. The greatest value of this bibliography lies just in referring the prospective comparatist to data already extant and as yet undigested, and, by implication, in pointing up the lacunae in our knowledge, particularly of Aymara linguistics.

THOMAS A. SEBEOK
INDIANA UNIVERSITY

SEMÁNTICA Y ETIMOLOGÍA EN EL GUARANÍ. By Antonio Tovar. Bogotá: Boletín del Instituto Caro y Cuervo 5.41–51, 1949.

Professor Antonio Tovar, an able Spanish linguist of Salamanca who is well known for his studies of Iberian languages, has now turned his attention to Guaraní. Another study was published in 1950 (Ensayo de Caracterización de la Lengua Guaraní. Mendoza: Annales del Instituto de Lingüística 4.114–126) and he is now preparing a scientific grammar of Guaraní. It is good for South America, where there are so few well prepared linguists, that a scholar of Tovar's ability applies his knowledge of general linguistics and Indo-European languages to the study of American Indian idioms.

In the article under review Tovar discusses some semantic phenomena and suggests some etymologies. He deals mainly with modern Guaraní (examples collected from Muniagurria's El Guaraní, Buenos Aires, 1947, and Guasch's El Idioma Guaraní, Buenos Aires, 1948), but he frequently refers to Old Guaraní (quoting Montoya's works, first published in 1639) in order to clarify the modern forms. In this review my only aim is to comment on the examples and analyses presented by Tovar, and to show that a comparison not only with Old Guaraní but also with Old Tupí is often necessary to explain modern Guaraní forms.

Analyzing modern Guaraní pĩąpę́ *finger nail* and pĩsąpę́ *toe nail* (p. 43),[1] Tovar concludes pĩ means not only *foot* but also *hand*. In this case he did not consult Old Guaraní, which has pwapę́ *finger nail* and pĩsapę́ *toe nail* (Old Tupí poapę́ ~ pwapę́ and pĩsapę́) and OG pwą́ *finger* and pĩsą́ *toe* (OT poą́ ~ pwą́ and pĩsą́). poą́ ~ pwą́ is evidently related to pó *hand*, and pĩsą́ to pĩ *foot*. Modern Guaraní pĩąpę́ *finger nail* is certainly the result of an analogical influence of pĩsąpę́ on OG pwapę́. This analogical influence was made easier by the phonetic change undergone by pwą́ *finger*, which in both OG and MG became kwą́ (pw > kw is a normal shift in Guaraní: pweráb > kwerá *to get well, to heal*, pwán > kwą́ *to pass, to run*, apwą́ > akwą́ *upper lip*, etc.) and lost its resemblance to pwapę́ *finger nail*.

From comparison of OG and OT pwapę́ *finger nail*, pĩsapę́ *toe nail* with pwą́ *finger* and pĩsą́ *toe*, respectively, we may isolate a morpheme pę́ *nail*, which is not to be confused, as Tovar does, with Guarani pę́ *angled*. The difference between these two morphemes is very clear in OT: *nail* is pę́ as seen in the forms cited above, while *angled* is pém (nominal aspect péma; cf OT itápéma

[1] I use Tovar's notation of phonemes instead of that customarily used in IJAL.

= OG itápẹ́ *angled stone*). The loss of the last consonant and the nasalization of the preceding vowel caused Guaraní pém *angled* to fall together with pẹ́ *nail*.

tuyuyú *stork* is analyzed (p. 44) as a compound of tuyú *clay* and yú *coming*. Here is another case of convergence determined by phonetic change, which is cleared up by Old Tupí. OT *clay* is tuyúk and *coming* is yúr ~ úr (final consonants are normally lost in MG). A compound of these stems in OT would be *tuyúkúra, but no such compound of a subject and intransitive verb occurs in this language. On the other hand, *stork* in OT is tuyuyú as in Guaraní, and it is certainly unrelated to either tuyúk or yúr ~ úr.

Tovar considers aykó *I am* (p. 45) as the verbalization of the demonstrative kó *this*, to be translated as (*I-it-*[*am*]) *this*, and similarly considers aimé *I am* to be based on an alternant of the morpheme pe *in*. In regard to the second verb, cp. OT aín *I am sitting* + -bé, intensive, = aímbé ~ aímé *I am sitting, I am, I exist*, and aykó *I am* + -bé, intensive, = aykóbé *I am, I live*; aímé has no relation with the locative morpheme -pe ~ -me (called a 'preposition' by Tovar). The first verb, aykó *I am*, is simply the stem ikó ~ ekó *to be* preceded by the first person morpheme a-.

mbohapî *three* is presented (p. 46) as a causative of (a)hapî *to burn*. This lacks semantic evidence. Morphology also shows that it is not correct. Indeed the causative morpheme mbo- ~ mo- is not prefixed to a transitive verb such as (a)hapî (stem apî) but only to intransitive verbs. Comparison with OT also shows that mbohapî has nothing to do with (a)hapî. *Three* in OT in mosapîr, corresponding to OG mbohapîr; mo- (OG mo- ~ mbo-) is a prefix occurring in all OT numerals: moyepé (OG moñepé) *one*, (mokǫ́y) (OG mokǫ́y *two*, mosapîr (OG mbohapîr) *three*, moñerundîk *four*. It is clear, therefore, that the stem of mosapîr *three* is sapîr (which is not found isolated) while *to burn* in OT is expressed by the stem apî (1st sing. asapî = OG, MG ahapî). Baptista Caetano[2] has explained OG mbohapîr *three* as a causative of apîr *point*; this etymology is also unacceptable, for it does not justify the phoneme -h- (OT -s-); the causative of apîr is mboapîr *to begin* (Montoya, Tesoro 51v).

gwasú *deer* is identified (Tovar, p. 48) with gwasú *large*, but OT sïgwasú *deer* seems to indicate that the Guaraní word for *deer* may be the result of an apheresis. In Old Tupí, as in Guaraní, gwasú *large* is not properly an adjective as Tovar supposes, but an alternant of the augmentative suffix occurring after stems ending in vowels.

Tovar considers (p. 49) (t)a?î (*his*) *son* and (t)ayî (mistakenly written (t)aįî) (*his*) *daughter* as metaphors derived from ta?įy (mistakenly written ta?îy) *seed, testicle*. There is here a metaphor, but it is not the one meant by Tovar. The Old Tupí forms taîra (stem aîr) *his son*, tayîra (stem ayîr) *his daughter*, and taįña (stem aįy) *seed, grain, testicle* clearly show that the stem of the third word cannot be confused with the stems of the other two. The metaphor I have noted is evidenced by OT taîra, MG ta?î *his semen* = *his son*. The meaning *testicle* added to the stem aįy (nominal aspect taįña) *seed, grain* is due to the compound apyá-aįy (nominal aspect tapyá-aįña) *testicle grains*.

The examples examined above show that Old Tupí forms frequently elucidate those of Guaraní, particularly because Old Tupí is in many instances phonemically more archaic than Guaraní. Notwithstanding the criticisms made here, Tovar's article is a very interesting contribution to the study of Guaraní etymology and semantics, and

[2] Baptista Caetano de Almeida Nogueira. Vocabulario das Palavras Guaranis Usadas pelo Traductor da "Conquista Espiritual" do Padre A. Ruiz de Montoya. Rio de Janeiro: Annaes da Bibliotheca Nacional do Rio de Janeiro 7.248, 1880.

contains many good interpretations of Guaraní forms and meanings.

ARION D. RODRIGUES
UNIVERSITY OF PARANÁ (BRASIL)

RADIOGRAPHY OF THE SUPRAGLOTTIC SPEECH ORGANS. By Alexander S. MacMillan and George Kelemen. American Medical Association Archives of Otolaryngology 55.671–88 (1952).

Abstracts (in our work) fall into a phantasy class sometimes termed desiderata. In place of having a regularized publication outlet for abstracts, we gain information by reading surveys about fields in which technical specialization requires so much laboratory equipment that few of us even hope to have direct experience with the specialization. Physiological (= anatomical) phonetics (= phonatory = articulatory movements) is the field under review. Its direct study requires special training and special equipment, of course, but also willing subjects who are asked to undergo special treatment before the special equipment is brought to bear on them—as having the soft parts of their mouth painted or otherwise covered with membranes and what not, and also having thin chains and tiny bells dangling about their nasal and oral cavities. What makes a good subject for physiological phonetics and what makes a good informant for linguistics is not always an identical virtue. We like our informants to have teeth, especially front teeth; they like their subjects to be without teeth. We like our informants to be as innocent as possible; they congratulate themselves when they obtain a trained singer because such a subject is "able to build the vowels with an unsurpassed clearness and impeccable resonance." We elicit utterances from the natural language of the informant; they do not confine their interest to utterances from natural languages but will observe also ". . . a theatrical imitator of instruments . . . mechanisms of swallowing, respiration, snoring, ventriloquism, and others . . . the entire speech mechanism from the diaphragm to the lips . . ."

Publications on physiological phonetics as viewed with x-rays began a year and a half after the appearance of Roentgen's *Eine neue Art von Strahlen* (1895). In their paper, MacMillan and Kelemen tell what has been done from then until now. We should like to reprint their terminal bibliography, together with the typed "Addenda, to the Bibliography" which the authors generously included with their printed paper which they sent to us for review; however, the reprint is clearly marked "Copyright, 1952 by American Medical Association."

C. F. VOEGELIN
INDIANA UNIVERSITY

AMERICAN NAME SOCIETY

A group of scholars, meeting in a conference on onomastics in Detroit, have voted to organize the American Name Society for the purpose of promoting and encouraging the study of place names, personal names, and scientific and commercial nomenclature. In April, 1953, the new Society will publish the first issue of Names, a quarterly devoted to articles on names written by its members. Annual meetings will be held in December of each year at the same place and time as the meetings of the Modern Language Association.

Elsdon C. Smith is president of the new Society and Erwin G. Gudde the Secretary-Treasurer. Members of the Sponsoring Committee are: Harold W. Bentley, Margaret M. Bryant, Meredith F. Burrill, Frederic G. Cassidy, L. O. Colbert, Edward C. Ehrensperger, Duncan Emrich, E. E. Ericson, Edward A. H. Fuchs, Joseph G. Fucilla, Demetrius J. Georgacas, William Cabell Greet, Erwin G. Gudde, John P. Harrington, Atcheson L. Hench, Helge Kökeritz, Kemp Malone, Albert H. Marckwardt, H. L. Mencken, Mamie Meredith, P. E. Palmer, Thomas M. Pearce, Louise Pound, Robert L. Ramsay, J. B. Rudnyckyj, Elsdon C.

Smith, Vilhjalmur Stefansson, George R. Stewart, and Francis L. Utley.

All who were interested in the study of names are cordially invited to become members. The dues are: active members, $5.00; sustaining members, $25.00; library members, $5.00; and patrons, $1000.00. All memberships include subscription to Names. The first Society year ends December 31, 1953. Dues should be sent to Professor Erwin G. Gudde, Treasurer, American Name Society, University of California Press, Berkeley 4, California.

The Linguistic Institute

The Linguistic Institute for 1953 will offer instruction in linguistic methodology—on both introductory and advanced levels—as well as courses which describe and compare languages. Several distinguished scholars will explore the relationship of linguistics to other branches of knowledge.

Elementary Methodology. Among the introductory methodological courses will be two dealing with phonetics: the one by Uldall stressing practical work, and the one by Joos emphasizing acoustic theory. Joos will also give phonemics. Paratore's laboratory will enable beginners in applied linguistics to learn by participating as student instructors in her classes in English for foreign students. Of the two field methods courses given by Voegelin, the first is designed especially for elementary students, and is intended to impart the skills of recording with the assistance of Crow and Hidatsa Indians.

Advanced Methodology. Modern linguistic theory from both European and American points of view will be presented in Uldall's exposition of glossematics, and Bloch's of grammatical theory. The assumptions underlying the comparative method will be given by Hoenigswald. Statistical procedures applied to linguistic problems will be presented by Osgood. Voegelin's second field methods course will show how to elicit structure and how to translate texts from Hidatsa and Crow.

Current Trends. The latest frontiers of linguistic research, in eight fields, will be explored by Chao for Sinitics, Fries for English, Harris for discourse analysis, Leslau for Semitics, Leopold for child language and child bilingualism, Malkiel for etymology, its assumptions and techniques, Poppe for Altaic languages, and Whatmough for Indo-European languages.

Interdisciplinary. Language will be examined in relation to culture by Hoijer; to psychology by Osgood; to philosophy by Bidney; and to literature by Lotz, jointly with a Fellow of the School of Letters.

Indo-European. Ten courses deal specifically with Indo-European languages—still spoken or extinct—both descriptively and historically. These are (in addition to Velten's course on the family as a whole): Italic dialects (Hoenigswald), and Romance languages (Hall); Sanskrit (Emeneau); Greek and Latin (Householder); Gothic (Velten); and Middle and Modern English (Whitehall); and pidgin or creolized languages based on English or Romance languages (Hall).

Non-Indo-European. Eleven courses involve non-Indo-European languages of three continents and Oceania. (This does not include Hidatsa and Crow, used in the field demonstration courses described above.)

America is represented by the Athapaskan languages, to be compared by Hoijer; and by the Siouan languages, to be demonstrated with native informants.

Asiatic languages at the Institute will comprise members of the Dravidian group (Emeneau), and be represented by an exposition of the structure of Japanese (Bloch).

Oceanic languages—including a special course on Javanese ethnolinguistics—will be given by Uhlenbeck, a leading specialist, coming to the Linguistic Institute from the Netherlands.

Three Finno-Ugric specialists — Lotz, Raun, and Sebeok—will join forces to give

Hungarian, Finnish, Estonian, Mordvin, and Cheremis, besides a general introduction to the Finno-Ugric family as a whole.

SEMINARS AND CONFERENCES. A group of faculty seminars, with limited student participation, will be announced in a later bulletin. The seminars now being planned include one devoted to psycholinguistics, one to ethnolinguistics, one to translation (mechanical and otherwise), and one to the philosophy of language and the science of linguistics. An exploratory conference on methods for archiving languages of the world (with special attention to Oceania) is also being planned. The fifteenth Summer Meeting of the Linguistic Society of America will be on the campus of Indiana University, August 7–8.

ADDITIONAL INFORMATION. Please address the Assistant Director, Thomas A. Sebeok, Indiana University, Bloomington, Indiana.